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ABSTRACT

The Rasch Model was used to define the word analysis skill variable and to develop, field test, and calibrate a corresponding test for grades 2-12: the Emory Word Analysis Skill Inventory (EWASI). Word analysis objectives focusing on content and hierarchical levels of difficulty were identified and field tested with 78 students, grades 2-12, enrolled in a clinical reading program. The original 431 items in 22 subscales were then calibrated to parallel forms A and B. Each form contained 137 items in 13 subscales and three subgroups labelled: consonants, vowels, and word structure: 134 items clearly fit the test. Each form has the same item difficulty, width, and precision. (RL)

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Developing, Field Testing And Calibrating A Word Analysis Skill Inventory

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ABSTRACT

Developing, field testing and calibrating a measure of word analysis skill was the central concern of the present study. Using the logistic Rasch model for mental tests, the investigators calibrated a carefully developed 431-item diagnostic inventory of word analysis skill field tested on 78 students ages 6 to 19. The analysis indicated a well-defined word analysis variable, consisting of 247 items across 13 objective-referenced subscales, and three content subgroups labelled "Consonants," "Vowels," and "Word Structure." Parallel forms A and B, each containing 137 items, were calibrated and constitute the Emory Word Analysis Skill Inventory (EWASI), Forms A and B.

STATEMENT OF THE PROBLEM

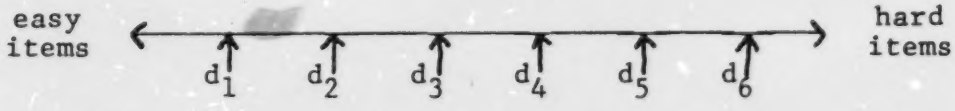
For several years, students and faculty alike, in the Reading Program of the Division of Educational Studies, Emory University, have been involved in the development of an Inventory of Word Analysis Skill. The Inventory would provide a useful diagnostic instrument for teachers who have neither time nor expertise to construct their own test. The Inventory should aid them in analyzing student performance in terms of specific objectives of knowledge, understanding, and skill of word analysis tasks. Initial steps in building a useful test to suit the purposes of the Emory Reading Center have taken place. These steps include (1) the decision to build a measure which would assess the mastery of skills and knowledge of students who are instructed in the Center, (2) an analysis of the curricula of surrounding school systems, (3) the formation of broad behavioral objectives for the students in the Center, (4) the writing of a number of items by graduate students, and (5) the sequencing of the items according to experts in the field of content, i.e. 14 teachers of reading in the Metropolitan Atlanta area and two professors of Reading at Emory University.

Since word analysis skill is a complex variable delineating a wide range of characteristic trais, the Inventory sampled numerous items across the range of possible content skills. A central problem of the present research was to define the "word analysis skill" variable by mapping its structure. Subsequent to solving the measurement problem, the Emory Word Analysis Skill Inventory would have great clinical importance in diagnosing individual reading problems.

Developing, field testing, calibrating and implementing the Inventory suggest far reaching importance to both the Emory University Reading Center and to any instructional program interested in measuring and diagnosing word analysis skill.

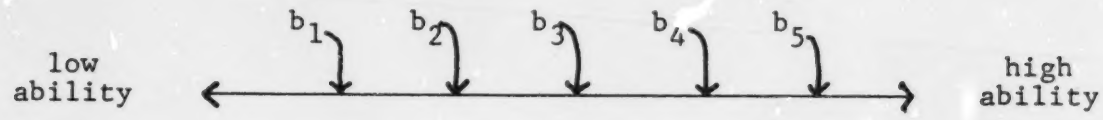
THEORETICAL CONCERNS

In order to develop a test that measures a variable, like word analysis skill, care must be taken to assure that all reasonable traits along the variable are measured, and that the measurement instrument is sufficiently wide to measure the population for which it was calibrated. For example, if one were interested in measuring a football field, a bent twig would hardly be the appropriate measurement instrument! In terms of word analysis skill, the central task was to define the domain or universe of traits delineating the variable and to test their validity or "fit" to the family of word analysis skill items. Until such items are calibrated, a valid person measurement would be impossible. The word analysis skill variable graphically would look somethinglike this:

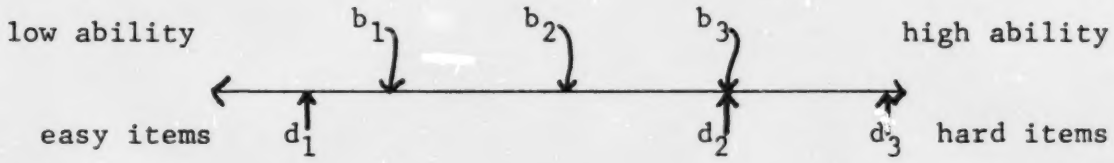


Some items (d_i) are easier and some are harder because the complexity of skill required by some items are more difficult than others. Consider the difference between two likely candidates: 1)"cat"; 2)"anatomical." In turn, it is commonly held that people also vary in their ability or "mastery" of word analysis skill.

This domain could be illustrated by:



Some people (b_n) are low in word analysis skill and some are high. John has trouble with "thin" while Mary can read "philanthropist." In essence, both word analysis skill items and person ability or mastery of word analysis skill have their own distribution in abstraction. There does, however, appear to be an ordering, or "latent structure" to these abstract variables. The concern in calibrating items and measuring persons is to represent the relationship of items and persons and to map the dynamics of the marriage:



Assume: b_1 = June's word analysis skill

b_2 = Jack's word analysis skill

b_3 = Jill's word analysis skill

and d_1 = "cat"

d_2 = "earthquake"

d_3 = "anatomical"

When June (b_1) is asked to read "cat" (d_1), she should get it right, since she is more able than the item is hard. She would have a probability of success which exceeds 50%. However, June would be very unikely to read "anatomical" or even "earthquake," since

she is less able than the items require. In this case, her probable success is less than 50%. The "critical point," the point at which a person's ability or word analysis skill equals the item difficulty (when $b_n=d_i$) would indicate a 50% chance of success on the item. An example of this can be seen with Jill (b_3) responding to "earthquake." In this case, Jill is just as likely as not to read "earthquake" correctly, since the item is centered on her word analysis skill. Notice the independence of the interpretation. Once representative persons (i.e. those who have characteristics typical of the population being measured) are given representative items of the variable being investigated, such persons and items can be removed from further considerations of the test and "norm group." This principle of sample free measurement and test free item calibration is the essence of Rasch measurement models as described by Wright (1977) and Wright and Stone (1979). The present paper illustrates a fascinating application of the Rasch model for mental tests.

PROCEDURE / RESULTS

Development

In order to define the domain or universe of items that delineate the word analysis skill variable, objectives were written for each of 22 general areas or subscales. In Appendix A, the original Inventory is presented with corresponding objectives for each subscale. The objectives, which focus on content and hierarchical levels of difficulty, were identified by reading teachers, University professors, and graduate students. Also, other well

known inventories and authorities in the field were consulted (Triggs, 1979; Rosewell & Chall, 1978; Miller, 1974; Potter & Rae, 1973). In addition, content validity was affirmed by the Director, the Coordinator of Services, and the Test Administrator of the Emory University Reading Center. The test was designed so that a minimum of five items measured each objective (Noll, Scannell, & Craig, 1979).

Field Testing

Seventy-eight students enrolled in the Emory University Reading Center were given the original form of the Inventory. The sample represented all students enrolled in the clinical reading program during the past year (December, 1978 to December, 1979). The demographic breakdown for grade and age is given below. There were 57 boys and 21 girls.

Grade	Age	f	cf
2-4	8-9	24	78
4-6	10-11	14	54
6-8	12-13	16	40
8-10	14-15	15	24
10-12	16-17	08	09
12	18-19	01	01

The students were enrolled in an individualized tutorial reading program initiated by parents. The subjects were referred to the program because of various reading disabilities, i.e. they had serious discrepancies between their reading ability and their reading achievement. No control over demographic characteristics

was therefore possible. The children were, however, representative of the clientele served by the clinical reading program over the course of one year.

The test was individually administered by teachers who had been given special instructions for the administration of the Inventory, such as: 1) record the child's incorrect response noting the nature of the mistake; 2) do not correct or show obvious approval of the child's responses; 3) provide adequate time for the test administration- do not speed responses. Each item was scored dichotomously (right=1, wrong=0) and a summative raw score was tabulated for the entire 431-item original Inventory.

Item Calibration and Measurement of Persons

Analyzing a test with the length (431 items) and structure (22 subscales) of the Emory Word Analysis Skill Inventory was a formidable task. The foundation of the task was the Rasch model for mental tests where the categories of responses are dichotomous:

1 0
right / wrong

$$Pr(X_{ni} = 0,1 \mid \beta_{ni}, \delta_i) = \frac{\exp\left[X_{ni}(\beta_n - \delta_i)\right]}{1 + \exp\,(\beta_n - \delta_i)}$$

where: X_{ni} is response X (0 or 1) of person n on item i, β_{ni} is the person ability (estimated by b_n) of person n on item i, and δ_i is the item difficulty (estimated by d_i) of item i.

The Rasch model is logistic in nature and is calculated by estimating the ratio of the probability of a right answer (numerator of the equation) to the probability of a wrong answer (the

denominator). Both b_n and d_i are expressed as logits, or log odds units. The d_i are centered (by a scaling factor) on a mean of 0 and a standard deviation peculiar to the item distribution. The b_n are similarly distributed, except that their mean indicates the mean person position along the variable on which they are measured. Negative logit values indicate low positions (i.e. easy items or low ability) and positive logit values indicate high positions (i.e. hard items or high ability). Logit values of 0 indicate the center of person ability and item difficulty. Optimal testing conditions occur when the person ability estimate equals the mean difficulty of the test (Wright & Stone, 1979). This can be demonstrated by investigating the standard errors of estimation when $b_n=0$. The analysis of the Inventory was facilitated by BICAL 3 (updated version), a computer program for Rasch measurement for mental tests (Copyright 1979 by R.J. Mead, B.D. Wright, and S.R. Bell, The University Of Chicago, Department of Education).

Approaching the item and person analysis problem lead to some general guidelines and procedures for editting items and persons. A distinct feature of the Rasch model is the analysis of fit, which is a validity test for item and person performance, respectively. In addition to spotting bad items, the Rasch model identifies person response patterns which are improbable, or not valid. The fit statistic, or Fit T, is distributed as a Chi-Square, with mean 0 and standard deviation 1. Clinical application of the "analysis of fit" has tremendous potential for insightful diagnosis of person measurement (see "Mapping the Emory Word Analysis Skill Inventory").

The initial procedure of the analysis was to examine the 22 original subscales individually. Since the BICAL program automatically edits misfitting persons (those with Fit T's: -2.0>T>2.0), only bad items (those with Fit T's: -2.0>T>2.0) needed to be deleted for subsequent investigation. In most cases, at least 80 per cent of the subscale items fit their content (objective-referenced) definition; however, the first seven subscales (Upper Case Letters to Short Vowel Sounds) were far too easy for any accurate definition along the word analysis skill variable. Also, subscale -igh Patterns contained only five items and was also too easy. Hence, eight complete subscales were deleted. It also appeared that subscales "L and N Patterns" and "C and G Patterns" suggested parallel tasks and objectives. When the two subscales were analyzed together, all items fit the same content variable. They were therefore united to one subscale "L and N, C and G Patterns." Thirteen subscales remained for further investigation.

Upon looking over the remaining subscales, the investigators identified three groups of subscales which appeared well-defined when considered individually. The three outstanding groups were labelled "Consonants," "Vowels," and "Word Structure." The main criterion used for this hypothetical substructure was the consideration of the subscale objectives. In order to ease the organization and further analysis of the data, the following "dictionary" was developed:

Consonant Subgroup:

Subscale No.	Subscale Name
1	Consonant Digraphs

Subscale No.	Subscale Name
2	Final Blends and Double Consonants
3	R Controls
4	Initial Blends
5	L and N, C and G Patterns
Vowel Subgroup:	
6	Magic E
7	Vowel Combinations
8	Vowel Sounds
Word Structure Subgroup:	
9	Compound Words
10	Inflectional Endings
11	Suffixes
12	Prefixes
13	Multisyllable Words

A second round of analysis was conducted on the three subgroups using only those items which fit their respective subscales (N=299). Only 24 items (about 8%) misfit their respective subgroups. The structure of the Inventory appeared well-defined with 275 items in three subgroups and 13 subscales. In addition, Table 1 illustrates that the subscales, subgroups and complete Inventory measure wide ranges of word analysis skill. Precision of estimation (reliability) appeared strong, as is evidenced by small standard errors of estimation of item difficulties.

Insert Table 1 About Here

Collecting the 275 items which demonstrated validity (fit) to their respective subscales and subgroups, the analysis focused on the complete Inventory. The results of this analysis provided the necessary information to calibrate final forms of the Inventory. Table 2 presents a summary of the relevant information used to revise the Inventory. In the panel labelled "Fit Order," column labelled "T-Tests Total," the fit statistics are presented for each item. Also, Appendix B summarizes the results of this analysis, indicating the items along with their final status in the analysis. Note that the "ITEM NAME" column in Table 2 corresponds to the "ITEM NAME" column in Appendix B (i.e. V001 denotes "shard"). Of the 275 items analyzed, only 28 (about 10%) misfit ($-2.0 > T > 2.0$) the word analysis skill variable, as measured by the complete Emory Word Analysis Skill Inventory. Thus, the 247 fitting items from the computer analysis presented in Table 2 define the word analysis skill variable.

Insert Table 2 About Here

In order to construct or map the Emory Word Analysis Skill Inventory, each subscale was plotted (see Appendices C and D), using one item from each distinct level of item difficulty from each subscale. The number of such distinct levels of item difficulty define the width of each subscale along the word analysis skill variable. In all, 137 items remained calibrated on the Inventory. The properties of these items (i.e. fit, difficulty, and standard error) remained stable, since all items were selected from the previous analysis of fitting items (see Table 2). In addition,

each subscale was reanalyzed with their respective items fitting the entire Inventory. In each case, all items fit their respective subscales. Thus, both subscales and the total Inventory are additive measures (as well as subgroups, though they were not specifically defined for that purpose).

As a final check on the validity of the Inventory, the 137 items in Form A were reanalyzed to insure their fit. From Table 3, it is seen that 134 items clearly fit (98%) the test. Since this result was within reasonable statistical boundaries with respect to a valid scale, the 137 items were calibrated for future use.

Insert Table 3 About Here

Psychometric Properties

From Table 1 (see Table 1 above), it is seen that the width of the Complete Inventory is 8.12 logits with mean 0.07 and standard deviation 1.66. The width of the Emory Word Analysis Skill Inventory is indicative of an optimal survey measure (Wright & Stone, 1979). The Inventory is also highly precise, as evidenced by the small standard error (0.11) of item calibration. Further support for the reliability of the Inventory was a person separability index (equivalent to KR-20) of 0.97. The subgroups showed similar positive qualities- about 5.5 logits wide and small standard errors (0.20) of calibration. While the subscales were rather narrow (about 3 logits wide), this appeared logical since they were based on objectives with a relatively narrow range of difficulty.

The subscales were also highly precise, with small standard errors (0.25) of calibration. Validity is evident throughout the structure of the Inventory, as evidenced by the fit statistics for both items and persons (see Table 2 and Appendix B).

Mapping the Emory Word Analysis Skill Inventory

Appendices C and D present parallel forms A and B of the Emory Word Analysis Skill Inventory (EWASI) along with instructions for administration. Keeping in mind that all items, subscales, and subgroups were calibrated on the same logit scale, any given raw score implies performance on specific test items and groups of items. For example, if Mary gets a total score of 127, she had at least a 50 per cent chance of answering correctly any item on any subscale (or subgroup) that falls to the left of the vertical line that could be drawn down the page at total raw score= 127, indicated on the bottom line labelled "Raw Score." Looking at the EWASI Form A in Appendix C, this would mean that Mary with a total raw score of 127 had better than a 50 per cent chance of answering correctly all items to the left of "quagmire," and probably missed all items to the right of "quagmire." This is Mary's most valid response pattern, and under these circumstances, the test administrator would feel confident about the validity of the measurement of Mary's word analysis skill. If, however, Mary answered correctly the five items above her ability, clinical investigation would be indicated. For example, if Mary answered four of the five items above her ability correctly (i.e. she got four of the hardest words correct), but missed all four items in "Compound Words" (Subscale 9), this pattern would suggest a serious

deficiency in compound words mastery. The test administrator in this case should verify the deficiency by asking Mary these items a second time to assure she was attentive and does indeed have such a deficiency in reading compound words. This investigation of a response validity is unique to the Rasch model and demonstrates an empirical indicator of process peculiarities. Diagnosis, which had been strictly evaluation and assessment concerns, is now possible using the logistic Rasch model for sample free measurement and test free item calibration.

Another aspect of the map which is somewhat useful is the "Grade Score" approximation along the bottom line of Appendix C. While grade norms are constantly changing as instructional techniques, curricula, and similar variables are redesigned, the present grade norms adequately represent the typical population of the Reading Center (at least for now). Looking at the "Grade Score" line along the bottom of Appendix C, it is seen that Mary's score of 127 (using the previous example) would suggest that she is similar in word analysis skill to an eleventh grade student.

Consistent with theories of development, it appeared that progression in school (and age) resulted in higher word analysis skill and that the most rapid change occurred between birth and fourth grade (total raw score from 0 to about 98). Recalling the principle of person ability centering on item difficulty results in 50 per cent chance of success, consider the following examples of "50-50" items for students at various grade levels.

Grade	$\bar{b}_n$ (in logits)	Items Students Have 50% Chance of Passing
2	0.06	chop, soil, official
3	0.90	gem, cute, ability
4	1.32	huge, stint, riding
5	1.61	cigar, nape, unintentional
6	2.01	quest, thickness, inexact
7	2.11	haul, stafe, intercity
8	2.40	hoax, sprig, misdirect
9	2.74	gel, sprig, unnatural
10	3.00	unnatural, precautionary, rationalization
11	3.89	discrepancy, quagmire, suspicious
12	4.04	anatomical, inexplicable, inconsequential

In each case, the item difficulty matches the mean word analysis skill for students at each grade level, providing a diagnosis of the position of typical students along the word analysis skill variable. The ordering of both students and items seem logical, indicating strong evidence of a valid measurement for students across eleven grade levels!

Although the EWASI appeared too easy in general, the width of the test compensated for much of this deficiency. However, precision would be improved by further item development to broaden the width of easy subscales.

CONCLUSION

Attempting to develop, field test, and calibrate a test across a wide range of ability (grades 2-12) is plagued by substantive and empirical ambiguities. The investigators of the present study

completed such a task relatively unscathed. The Emory Word Analysis Skill Inventory (EWASI), originally containing 431 items in 22 subscales, was revised to Parallel Forms A and B (see Appendices C and D), each containing 137 items in 13 subscales and three subgroups labelled "Consonants," "Vowels," and "Word Structure." Each form is identical in item difficulty, width, and precision. Approximate grade norms were also calculated for the clinical population which responded to the test (N=78).

The Word Analysis Skill Variable was well-defined by the present Inventory and item calibrations were quite precise. Future research should, however, concentrate on writing harder items consistent with some of the easier subscales, and easier items for the Multisyllable Subgroup (Subgroup 13). Also, if "accurate" age/grade norms are absolutely necessary, the test should be given to a large number of students at various grade levels.

The analysis was facilitated by the Rasch model for mental tests, a logistic measurement model for sample free measurement and test free item calibration. The Rasch model was valuable in defining the word analysis skill variable and its family of additive subscales.

Of particular importance is the diagnostic value of the Emory Word Analysis Skill Inventory. Only through careful test development and appropriate field testing and calibration techniques has the EWASI achieved a diagnostic capacity to consider the process (i.e. validity, clinical abnormalities, etc.) of the individual's responses. Future efforts in test development must be sensitive to individuals and their response abnormalities if measurements are to have validity on an individual level. This is of particular concern to

parents, teachers, and tutors who confront test scores of individuals who require individualized diagnosis and instruction.

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Table 1- Summary of Range of Item Difficulty, Width, Mean Difficulty, Variance of Item Difficulty, and Standard Error of Item Difficulty Means by Subscale, Subgroup and Complete Inventory

Scale	Range of d_i	Width	$\bar{d}_i$	s_{d_i}	$Se(\bar{d}_i)$
1	-3.57,0.42	3.99	-1.31	1.26	0.31
2	-3.08,0.26	3.34	-1.30	1.02	0.25
3	-2.32,0.10	2.42	-1.10	0.96	0.34
4	-2.01,0.10	2.11	-1.07	0.72	0.19
5	-2.32,1.67	3.99	-0.19	1.18	0.25
Consonant Subgroup	-3.57,1.67	5.24	-0.92	1.15	0.13
6	-2.32,1.00	3.32	-0.83	0.84	0.18
7	-2.32,2.30	4.62	-0.59	1.13	0.20
8	-0.42,2.79	3.21	0.87	0.65	0.09
Vowels Subgroup	-2.32,2.79	5.11	0.06	1.16	0.12
9	-1.48,-0.42	1.06	-1.13	0.44	0.20
10	-1.48,1.41	2.89	-0.54	0.82	0.25
11	-1.01,1.92	2.93	0.76	0.85	0.22
12	0.42,3.41	2.99	1.99	0.98	0.28
13	3.54,4.55	1.01	4.07	0.34	0.09
Word Structure Subgroup	-1.48,4.55	6.03	1.46	1.97	0.26
COMPLETE INVENTORY	-3.57,4.55	8.12	0.07	1.66	0.11

Table 2- Item Statistics for the Emory Word Analysis Skill Inventory

EMORY UNIVERSITY BASIC READING SKILLS INVENTORY- COMPLETE TEST — RECAL. WITH 7 MISFITTING PERSONS OMITTED — PG 36

SERIAL ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	STD ERROR	DISC INDX	FIT TTEST
1	C001	-1.01	0.47	1.06	-0.80
2	C002	1.41	0.36	0.99	0.30
3	C003	1.54	0.36	1.27	-1.34
4	C004	0.10	0.40	1.07	-0.34
5	C005	-0.86	0.45	1.00	-0.41
6	C006	0.26	0.40	1.30	0.09
7	C007	1.67	0.36	1.25	-1.59
8	C008	-1.24	0.48	1.08	-2.04
9	C009	0.10	0.40	0.99	0.18
10	C010	-0.06	0.41	0.97	0.59
11	C011	1.67	0.36	1.14	-1.10
12	C012	-1.48	0.50	1.05	-1.40
13	C013	-2.32	0.57	1.05	-1.06
14	C014	0.26	0.40	0.91	1.06
15	C015	-1.24	0.48	1.08	-1.23
16	C016	-2.01	0.54	1.07	-1.11
17	C017	-1.24	0.48	0.89	-0.23
18	C018	-0.80	0.45	1.30	0.58
19	C019	-0.42	0.43	0.89	0.48
20	C020	-0.42	0.43	0.93	0.81
21	C021	-1.01	0.47	1.06	-0.72
22	C022	1.67	0.36	0.83	1.07
23	C023	-0.61	0.44	1.01	0.13
24	C024	0.26	0.40	0.87	0.62
25	C025	0.10	0.40	1.00	-0.00
26	C026	-0.81	0.44	0.83	2.05
27	C027	-0.61	0.44	0.89	1.41
28	C028	-0.80	0.45	1.00	0.77
29	C029	-1.48	0.50	1.00	0.77
30	C030	-2.32	0.57	0.92	-0.04
31	C031	-2.01	0.54	1.07	-1.56
32	C032	-2.01	0.54	1.01	-0.73
33	C033	-0.42	0.43	0.94	0.77
34	C034	-0.02	0.41	0.83	1.63
35	C035	-5.18	1.14	1.01	-0.57
36	C036	-3.57	0.74	1.02	0.29
37	C037	-0.61	0.44	0.98	0.21
38	C038	-0.06	0.41	0.75	1.47
39	C039	-3.57	0.74	1.02	-0.43
40	C040	-3.57	0.74	1.02	-1.28
41	C041	-0.42	0.43	0.83	1.27
43	C043	0.42	0.39	0.91	1.06
44	C044	-0.42	0.43	0.68	1.73
45	C045	-1.73	0.52	0.97	0.28
46	C046	-1.24	0.48	1.14	-1.63
47	C047	-1.01	0.47	1.03	-0.34
48	C048	-2.32	0.57	1.05	-0.23
49	C049	-1.24	0.48	0.94	0.41
50	C050	0.10	0.40	0.85	1.17
51	C051	-1.24	0.48	0.85	1.87
52	C052	-1.01	0.47	0.99	-0.57

DIFFICULTY ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	DISC INDX	FIT TTEST
35	C035	-5.18	1.01	-0.57
221	V131	-5.18	1.01	0.88
221	V132	-5.18	1.01	0.88
36	C036	-3.57	1.02	0.29
218	V127	-3.57	1.02	1.27
39	C039	-3.57	1.02	-0.43
40	C040	-3.57	1.02	-1.28
67	C067	-3.08	0.95	0.16
219	V128	-3.08	0.95	0.33
226	V135	-3.38	0.95	2.51
223	V133	-2.67	0.97	1.80
225	V134	-2.67	0.98	2.69
74	C074	-2.67	0.97	0.74
13	C013	-2.32	1.05	-1.06
58	C058	-2.32	0.93	0.03
30	C030	-2.32	0.92	-0.04
68	C068	-2.32	0.93	1.20
48	C048	-2.32	1.05	-0.23
152	V061	-2.32	0.99	-0.80
199	V108	-2.32	0.99	0.49
31	C031	-2.01	1.07	-1.56
204	V113	-2.01	1.01	0.73
205	V114	-2.01	1.07	0.53
32	C032	-2.01	1.01	-0.73
16	C016	-2.01	1.07	-1.11
81	C081	-2.01	0.88	0.80
82	C082	-2.01	0.86	1.86
59	C059	-2.01	1.01	0.33
166	V075	-2.01	0.85	0.94
171	V080	-2.01	1.07	-0.84
150	V059	-1.73	0.97	-0.33
80	C080	-1.73	1.09	-1.83
71	C071	-1.73	0.91	0.35
45	C045	-1.73	0.97	0.28
175	V084	-1.73	1.09	-1.08
191	V100	-1.73	1.03	-0.96
84	C084	-1.73	0.87	1.52
89	C089	-1.73	0.97	0.76
315	W088	-1.73	1.09	-2.13
319	W092	-1.73	1.09	-2.13
65	C065	-1.48	0.97	0.35
155	V064	-1.48	1.02	-0.93
163	V072	-1.48	0.97	-0.12
29	C029	-1.48	1.00	0.77
12	C012	-1.48	1.05	-1.40
55	C055	-1.48	0.97	0.10
179	V088	-1.48	1.00	-0.27
62	C062	-1.48	1.00	0.93
195	V104	-1.48	1.05	-0.48

FIT ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	T-TESTS TOTAL	WTD MNSQ	MNSQ SD	DISC INDX	POINT BISER
264	W017	-0.24	0.0	1.01	-2.95	0.43	0.24	1.25	0.87
255	W024	-0.24	0.0	1.01	-2.85	0.44	0.24	1.25	0.86
277	W050	0.26	0.0	0.59	-2.67	0.51	0.22	1.27	0.84
318	W091	-1.01	0.0	0.76	-2.64	0.42	0.28	1.17	0.81
267	W040	-0.06	0.0	0.76	-2.61	0.49	0.24	1.25	0.84
282	W055	1.14	0.0	1.00	-2.47	0.58	0.19	1.37	0.81
274	W047	0.26	0.0	0.12	-2.33	0.56	0.22	1.23	0.83
273	W046	-0.24	0.0	-0.00	-2.30	0.52	0.24	1.18	0.84
257	W030	0.72	0.0	0.67	-2.19	0.61	0.20	1.24	0.82
289	W062	3.29	0.0	-0.01	-2.16	0.63	0.20	1.23	0.81
315	W088	-1.73	0.0	-0.56	-2.13	0.46	0.31	1.09	0.72
319	W092	-1.73	0.0	-0.56	-2.13	0.46	0.31	1.09	0.72
120	V093	-1.48	0.0	-0.15	-2.11	0.48	0.30	1.11	0.78
254	W007	0.72	0.0	0.14	-2.10	0.62	0.20	1.28	0.82
265	W018	0.42	0.0	0.01	-2.06	0.61	0.21	1.24	0.83
8	C008	-1.24	0.0	-1.11	-2.04	0.50	0.29	1.08	0.78
253	W026	0.66	0.0	-0.30	-2.01	0.64	0.20	1.25	0.82
231	W005	1.10	0.0	-0.21	-2.00	0.65	0.20	1.26	0.66
80	C080	-1.73	0.0	-0.56	-1.83	0.51	0.31	1.09	0.71
309	W082	1.41	0.0	0.16	-1.82	0.68	0.19	1.35	0.77
286	W059	0.42	0.0	0.01	-1.78	0.65	0.21	1.24	0.82
295	W068	0.72	0.0	0.97	-1.76	0.67	0.20	1.24	0.80
275	W048	-1.01	0.0	-0.53	-1.75	0.57	0.28	1.11	0.78
287	W060	0.10	0.0	-0.08	-1.68	0.65	0.23	1.18	0.82
283	W056	1.41	0.0	0.11	-1.64	0.71	0.19	1.28	0.76
46	C046	-1.24	0.0	0.29	-1.63	0.58	0.29	1.14	0.77
261	W034	3.41	0.0	0.07	-1.62	0.71	0.20	1.20	0.61
298	W071	-0.42	0.0	-0.67	-1.61	0.63	0.25	1.13	0.79
7	C007	1.67	0.0	0.65	-1.59	0.72	0.19	1.25	0.76
313	W086	-1.24	0.0	-1.11	-1.59	0.59	0.29	1.08	0.76
314	W087	-1.48	0.0	-0.15	-1.58	0.58	0.30	1.11	0.76
31	C031	-2.01	0.0	-0.94	-1.56	0.55	0.32	1.07	0.68
241	W015	3.78	0.0	1.13	-1.48	0.73	0.19	1.19	0.58
284	W057	0.10	0.0	0.35	-1.47	0.69	0.23	1.22	0.80
258	W031	2.79	0.0	0.70	-1.45	0.73	0.19	1.28	0.65
285	W058	1.67	0.0	0.35	-1.44	0.74	0.19	1.30	0.75
12	C012	-1.48	0.0	-1.65	-1.40	0.62	0.30	1.05	0.74
262	W035	0.42	0.0	0.67	-1.37	0.75	0.21	1.19	0.79
260	W033	2.67	0.0	-0.14	-1.36	0.75	0.19	1.33	0.67
288	W061	-0.42	0.0	-0.85	-1.36	0.68	0.25	1.06	0.78
3	C003	1.54	0.0	-0.41	-1.34	0.76	0.19	1.27	0.76
238	W012	4.16	0.0	-0.30	-1.30	0.77	0.19	1.11	0.53
40	C040	-3.57	0.0	-2.30	-1.28	0.46	0.48	1.02	0.52
162	V071	-1.01	0.0	0.76	-1.24	0.67	0.28	1.17	0.75
15	C015	-1.24	0.0	-1.11	-1.23	0.67	0.29	1.08	0.74
293	W066	1.67	0.0	-0.40	-1.23	0.77	0.19	1.14	0.74
252	W025	1.00	0.0	-0.64	-1.21	0.77	0.20	1.17	0.77
317	W090	-1.24	0.0	-1.11	-1.20	0.67	0.29	1.08	0.75
259	W032	1.54	0.0	0.41	-1.19	0.78	0.19	1.20	0.75
212	V121	-1.01	0.0	-1.51	-1.16	0.69	0.28	1.06	0.74

TABLE CONTINUED

SERIAL ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	STD ERROR	DISC INDX	FIT TTEST
53	C053	-0.80	0.45	0.91	1.19
55	C055	-1.49	0.50	0.97	0.10
56	C056	-4.20	0.86	1.31	-0.12
57	C057	-1.24	0.48	0.97	0.84
58	C058	-2.32	0.57	0.93	0.03
59	C059	-2.01	0.54	1.01	0.33
60	C060	-0.06	0.41	0.69	2.87
61	C061	-1.01	0.47	0.81	[illegible]
62	C062	-1.48	0.50	1.00	0.93
63	C063	0.26	0.40	1.04	-0.38
64	C064	0.10	0.40	1.15	-0.97
65	C065	-1.48	0.50	0.97	0.35
67	C067	-3.08	0.66	0.95	0.16
68	C068	-2.32	0.57	0.93	1.20
69	C069	-0.06	0.41	1.08	-0.69
70	C070	-0.80	0.45	0.85	1.06
71	C071	-1.73	0.52	0.91	0.35
72	C072	-1.01	0.47	1.00	0.30
73	C073	0.26	0.40	0.91	1.01
74	C074	-2.67	0.61	0.97	0.74
75	C075	-1.48	0.53	0.91	1.29
77	C077	-1.01	0.47	0.87	1.52
79	C079	-1.01	0.47	0.85	1.45
80	C080	-1.73	0.52	1.09	-1.83
81	C081	-2.01	0.54	0.88	0.80
82	C082	-2.01	0.54	0.86	1.86
83	C083	0.10	0.40	0.44	1.52
84	C084	-1.73	0.52	0.87	1.52
85	C085	-0.42	0.43	0.96	0.29
86	C086	-0.61	0.44	0.82	0.88
87	C087	-0.06	0.41	0.82	1.56
88	C088	-1.01	0.47	0.99	0.90
89	C089	-1.73	0.52	0.97	0.76
90	C090	-0.06	0.41	1.01	0.51
91	C091	-1.24	0.48	0.97	0.06
92	V001	0.72	0.38	0.98	3.34
93	V002	0.57	0.39	1.15	-0.75
94	V003	1.27	0.37	0.87	3.56
95	V004	-0.42	0.41	1.03	0.31
97	V006	0.86	0.38	0.91	-0.17
98	V007	0.10	0.40	0.74	1.20
99	V008	0.72	0.38	0.78	0.74
100	V009	1.41	0.36	1.11	-0.63
102	V011	0.86	0.38	1.20	-0.61
103	V012	1.92	0.36	1.02	-0.35
104	V013	0.10	0.40	1.06	-1.16
105	V014	0.42	0.39	1.04	-0.31
106	V015	1.00	0.37	1.02	-0.19
107	V016	0.86	0.38	0.86	1.04
108	V017	0.86	0.38	1.11	-0.14
109	V018	1.41	0.36	0.86	0.74

DIFFICULTY ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	DISC INDX	FIT TTEST
310	W083	-1.48	1.05	-1.07
314	W087	-1.48	1.11	-1.58
75	C075	-1.48	0.91	1.29
316	W089	-1.48	1.05	-0.84
201	V110	-1.48	1.05	0.58
320	W093	-1.48	1.11	-2.11
57	C057	-1.24	0.97	0.84
91	C091	-1.24	0.97	0.06
184	V093	-1.24	0.94	0.71
46	C046	-1.24	1.14	-1.63
15	C015	-1.24	1.08	-1.23
49	C049	-1.24	0.94	0.41
297	W070	-1.24	1.02	-0.57
51	C051	-1.24	0.85	1.87
313	W086	-1.24	1.33	-1.59
202	V111	-1.24	0.99	-0.25
164	V073	-1.24	0.97	0.06
8	C008	-1.24	1.08	-2.04
317	W090	-1.24	1.08	-1.20
213	V122	-1.24	1.38	3.04
17	C017	-1.24	0.89	-0.23
172	V081	-1.01	1.00	0.93
88	C088	-1.01	0.99	0.90
172	V081	-1.01	0.97	0.33
21	C021	-1.01	1.36	-0.72
47	C047	-1.01	1.03	-0.14
77	C077	-1.01	0.97	1.52
79	C079	-1.01	0.85	1.45
52	C052	-1.01	0.99	-0.57
275	W048	-1.01	1.11	-1.75
161	V070	-1.01	0.91	1.04
299	W072	-1.01	1.06	-0.96
302	W075	-1.01	1.06	-0.38
162	V071	-1.01	1.17	-1.24
1	C001	-1.01	1.06	-0.80
61	C061	-1.01	0.81	0.57
72	C072	-1.01	1.00	0.30
208	V117	-1.01	0.92	0.00
209	V118	-1.01	1.03	-0.98
318	W091	-1.01	1.17	-2.64
212	V121	-1.01	1.06	-1.16
167	V076	-1.01	0.85	1.93
121	W004	-1.01	1.03	-0.37
51	C051	-0.80	0.91	1.17
5	C005	-0.80	1.00	-0.41
215	V124	-0.80	0.94	0.69
70	C070	-0.80	0.85	1.06
210	V119	-0.80	1.13	-0.79
14	C014	-0.80	1.30	0.58
37	C037	-0.61	0.98	0.21

FIT ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	T-TESTS TOTAL	WTD MNSQ	MNSQ SD	DISC INDX	POINT BISER
266	W039	1.92	0.0	-0.38	-1.16	0.78	0.19	1.24	0.74
104	V013	0.10	0.0	2.13	-1.16	0.74	0.23	1.06	0.78
322	W095	-0.42	0.0	-0.67	-1.14	0.72	0.25	1.13	0.76
16	C016	-2.01	0.0	-0.94	-1.11	0.66	0.32	1.07	0.66
235	W009	3.54	0.0	-0.62	-1.10	0.79	0.19	1.17	0.60
11	C011	1.67	0.0	-0.40	-1.10	0.79	0.19	1.14	0.73
120	V029	0.57	0.0	0.04	-1.10	0.78	0.21	1.16	0.77
175	V084	-1.73	0.0	-0.56	-1.08	0.64	0.31	1.09	0.68
310	W083	-1.48	0.0	-1.65	-1.07	0.69	0.30	1.05	0.73
13	C013	-2.32	0.0	-1.30	-1.06	0.65	0.34	1.05	0.63
137	V046	0.42	0.0	-0.83	-1.05	0.78	0.21	1.16	0.78
229	W003	3.78	0.0	-0.97	-1.04	0.80	0.19	1.09	0.57
276	W049	1.54	0.0	-0.92	-1.04	0.80	0.19	1.15	0.74
148	V057	1.14	0.0	-0.55	-1.03	0.80	0.19	1.20	0.76
301	W074	0.10	0.0	-0.13	-1.01	0.77	0.23	1.11	0.78
281	W054	0.42	0.0	1.87	-1.00	0.79	0.21	1.10	0.77
209	V118	-1.01	0.0	-1.12	-0.98	0.73	0.28	1.03	0.71
64	C064	0.10	0.0	-0.89	-0.97	0.78	0.23	1.15	0.78
290	W063	1.14	0.0	-0.40	-0.96	0.81	0.19	1.26	0.76
299	W072	-1.01	0.0	-1.51	-0.96	0.74	0.28	1.06	0.74
190	V099	-0.61	0.0	-1.66	-0.96	0.75	0.26	1.04	0.76
191	V100	-1.73	0.0	-2.08	-0.96	0.71	0.31	1.03	0.65
155	V064	-1.48	0.0	-0.11	-0.93	0.72	0.30	1.02	0.70
248	W021	4.04	0.0	-0.75	-0.92	0.83	0.19	1.12	0.55
149	V058	1.00	0.0	0.59	-0.89	0.82	0.20	1.09	0.74
171	V080	-2.01	0.0	-0.94	-0.84	0.72	0.32	1.07	0.64
316	W089	-1.48	0.0	-1.65	-0.84	0.75	0.30	1.05	0.72
256	W029	0.57	0.0	0.27	-0.83	0.82	0.21	1.16	0.76
152	V061	-2.32	0.0	-1.86	-0.81	0.71	0.34	0.99	0.60
1	C001	-1.01	0.0	-1.51	-0.80	0.77	0.28	1.06	0.72
307	W080	-0.42	0.0	-2.23	-0.79	0.79	0.25	1.03	0.74
210	V119	-0.80	0.0	1.22	-0.79	0.78	0.27	1.03	0.73
143	V052	0.42	0.0	-1.28	-0.79	0.83	0.21	1.11	0.77
93	V002	0.57	0.0	0.04	-0.75	0.84	0.21	1.16	0.75
32	C032	-2.01	0.0	-2.19	-0.73	0.75	0.32	1.01	0.63
21	C021	-1.01	0.0	-1.51	-0.72	0.79	0.28	1.06	0.71
127	V036	0.10	0.0	-1.57	-0.70	0.83	0.22	1.07	0.77
69	C069	-0.06	0.0	-1.77	-0.69	0.84	0.24	1.08	0.75
243	W017	3.74	0.0	-1.01	-0.68	0.86	0.19	1.09	0.57
100	V009	1.41	0.0	1.30	-0.63	0.87	0.19	1.11	0.73
126	V035	-0.42	0.0	3.11	-0.62	0.83	0.25	1.02	0.71
102	V011	0.86	0.0	-0.34	-0.61	0.87	0.20	1.20	0.76
236	W010	4.42	0.0	-1.63	-0.59	0.89	0.18	1.07	0.50
115	V024	0.72	0.0	-1.15	-0.58	0.87	0.20	1.14	0.74
228	W002	3.54	0.0	-0.89	-0.58	0.88	0.19	1.12	0.57
52	C052	-1.01	0.0	1.40	-0.57	0.81	0.28	0.99	0.68
35	C035	-5.18	0.0	-3.61	-0.57	0.47	0.80	1.01	0.32
222	W013	-2.01	0.0	2.11	-0.57	0.87	0.29	1.02	0.60
312	W085	-0.24	0.0	2.59	-0.55	0.80	0.24	0.97	0.73
271	W044	1.27	0.0	0.54	-0.54	0.89	0.19	1.11	0.76
271	W044	2.67	0.0	-0.04	-0.50	0.90	0.19	1.16	0.69

TABLE CONTINUED

Table 2. Continued

SERIAL ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	STD ERROR	DISC INDX	FIT TTEST
110	V019	0.57	0.39	0.81	1.90
111	V020	0.57	0.39	0.85	1.43
112	V021	0.72	0.41	0.90	1.13
113	V022	2.10	0.56	0.88	2.11
114	V023	0.72	0.38	1.14	-0.58
115	V024	0.86	0.38	1.09	1.01
116	V025	1.67	0.36	1.01	-0.42
117	V026	1.00	0.37	0.97	0.44
118	V027	0.57	0.39	1.16	-1.10
119	V028	1.00	0.37	0.97	-0.17
120	V029	0.57	0.39	0.76	1.43
121	V030	1.14	0.37	0.97	-0.17
122	V031	1.00	0.37	0.76	1.43
123	V032	1.14	0.37	0.75	0.81
124	V033	-0.42	0.45	1.02	-0.82
125	V034	1.14	0.37	0.75	0.81
126	V035	-0.42	0.45	1.02	-0.82
127	V036	0.10	0.40	1.07	-0.70
128	V037	0.10	0.40	1.06	-0.24
129	V038	2.79	0.53	0.89	0.39
130	V039	0.10	0.40	0.95	0.88
131	V040	1.41	0.36	1.10	-0.28
132	V041	1.00	0.37	0.92	0.98
133	V042	0.42	0.39	1.07	-0.01
134	V043	1.27	0.37	0.94	0.95
135	V044	1.00	0.37	1.02	-0.34
136	V045	1.79	0.36	1.06	0.44
137	V046	0.42	0.39	1.16	-1.05
138	V048	1.92	0.36	0.96	1.34
139	V050	0.26	0.40	1.11	0.14
140	V051	0.57	0.39	0.93	0.61
141	V052	0.42	0.39	1.11	-0.79
142	V053	1.41	0.36	0.97	2.45
143	V054	0.42	0.39	1.11	-0.23
144	V055	2.55	0.35	0.77	1.60
145	V056	0.86	0.38	1.05	-0.33
146	V057	1.14	0.37	1.20	-1.03
147	V058	1.00	0.37	1.09	-0.89
148	V059	-1.73	0.52	0.97	-0.53
149	V060	-2.32	0.57	0.99	-0.81
150	V061	-1.48	0.50	1.02	-0.93
151	V062	0.86	0.38	0.91	0.65
152	V063	0.26	0.40	1.00	0.54
153	V064	0.72	0.38	1.05	0.50
154	V065	-0.61	0.44	1.02	0.02
155	V066	-1.01	0.47	0.91	1.04
156	V067	-1.01	0.47	1.17	-1.24
157	V068	-1.48	0.50	0.97	-0.12
158	V069	-1.24	0.48	0.97	0.06
159	V070	-2.01	0.54	0.85	0.04
160	V071	-1.01	0.47	0.85	1.58
161	V072	-1.01	0.47	0.69	1.87
162	V073	-1.01	0.47	1.17	-1.24
163	V074	-1.48	0.50	0.97	-0.12
164	V075	-1.24	0.48	0.97	0.06
165	V076	-2.01	0.54	0.85	0.04
166	V077	-1.01	0.47	0.85	1.58
167	V078	-1.01	0.47	0.85	1.58
168	V077	0.10	0.40	0.69	1.87
170	V079	0.42	0.39	0.70	2.01
171	V080	-2.01	0.54	1.07	-0.84
172	V081	-1.01	0.47	0.97	0.30

DIFFICULTY ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	DISC INDX	FIT TTEST
190	V099	-0.61	1.04	-0.96
193	V067	-0.61	1.02	0.02
195	V101	-0.61	0.95	0.06
21	C121	-0.61	1.01	0.15
197	V100	-0.61	0.79	1.77
27	C027	-0.61	0.15	2.05
34	C034	-0.61	0.89	1.41
80	C080	-0.61	0.82	0.88
217	V126	-0.42	0.90	0.88
41	C041	-0.42	0.83	1.27
136	W079	-0.42	0.98	0.58
107	W040	-0.42	1.03	0.31
83	C085	-0.42	0.96	-0.79
34	C044	-0.42	0.88	0.77
33	C033	-0.42	0.94	0.77
19	C019	-0.42	0.39	0.48
20	C020	-0.42	0.92	0.81
95	V004	-0.42	1.03	0.31
126	V035	-0.42	1.02	-0.82
283	W061	-0.42	1.06	-1.36
203	W137	-0.42	0.76	2.11
295	W071	-0.42	1.13	-1.61
322	W095	-0.42	1.13	-1.14
136	V095	-0.24	0.78	1.81
193	V092	-0.24	0.98	0.39
173	V082	-0.24	0.84	0.77
312	W085	-0.24	0.97	-0.55
255	W028	-0.24	1.25	-2.85
264	W037	-0.24	1.25	-2.93
273	W046	-0.24	1.18	-2.30
69	C068	-0.06	1.08	-0.69
93	C090	-0.06	1.01	0.51
267	W340	-0.06	1.25	-2.81
185	V094	-0.06	0.86	0.98
34	C034	-0.06	0.84	1.63
10	C010	-0.06	0.97	0.59
60	C060	-0.06	0.69	2.67
178	V087	-0.06	0.97	0.11
87	C087	-0.06	0.82	1.56
38	C038	-0.06	0.75	1.47
211	V120	-0.06	1.04	0.47
194	V107	-0.06	0.97	0.61
177	V086	0.10	0.65	1.97
50	C050	0.10	0.85	1.17
301	W074	0.10	1.11	-1.01
3	C009	0.10	0.99	0.18
180	V089	0.10	1.04	-0.12
98	V007	0.10	0.74	1.26
104	V013	0.10	1.06	-1.16
4	C004	0.10	1.07	-0.34
127	V036	0.10	1.07	-0.70

FIT ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	T-TESTS TOTAL	WTD MNSQ	UNWTD MNSQ SD	DISC INDX	POINT BISER
279	W065	-3.19	0.0	-1.44	-0.49	0.99	0.20	1.14	0.62
195	V104	-1.61	0.0	-1.03	-0.68	0.84	0.30	1.05	0.68
39	C039	-3.57	0.0	-2.30	-0.43	0.79	0.38	1.02	0.49
291	W304	0.42	0.0	-0.95	-0.43	0.90	0.21	0.99	0.74
117	V026	1.67	0.0	-0.96	-0.42	0.91	0.19	1.01	0.70
9	C009	-0.10	0.0	-1.96	-0.41	0.87	0.27	1.00	0.72
302	W075	-1.01	0.0	-1.51	-0.38	0.87	0.28	1.00	0.69
63	C063	0.26	0.0	0.99	-0.38	0.90	0.22	1.04	0.73
104	V017	0.86	0.0	-1.27	-0.38	0.91	0.20	1.11	0.74
321	W094	-1.01	0.0	-1.12	-0.37	0.88	0.28	1.03	0.67
103	V012	1.92	0.0	1.06	-0.35	0.92	0.19	1.02	0.70
47	C047	-1.01	0.0	-1.12	-0.34	0.88	0.28	1.03	0.68
4	C004	0.10	0.0	-1.57	-0.34	0.91	0.23	1.07	0.74
139	V044	1.00	0.0	-2.72	-0.34	0.92	0.20	1.02	0.72
147	V056	0.86	0.0	-1.69	-0.33	0.92	0.20	1.05	0.74
190	V099	-1.73	0.0	-0.91	-0.33	0.87	0.31	0.97	0.62
105	V014	0.42	0.0	-0.59	-0.31	0.92	0.21	1.08	0.73
299	W013	5.55	0.0	-1.67	-0.29	0.93	0.20	0.98	0.35
131	V040	1.41	0.0	0.08	-0.28	0.94	0.19	1.10	0.71
179	V083	-1.49	0.0	-1.40	-0.27	0.89	0.30	1.00	0.66
145	V054	0.42	0.0	-1.28	-0.25	0.93	0.21	1.11	0.74
174	V083	2.17	0.0	2.10	-0.25	0.94	0.19	0.92	0.63
202	V111	-1.24	0.0	-1.16	-0.25	0.91	0.29	0.99	0.67
128	V037	0.10	0.0	-0.06	-0.24	0.93	0.23	1.06	0.73
270	W043	2.55	0.0	-1.53	-0.24	0.94	0.19	1.11	0.65
227	W001	4.29	0.0	-1.73	-0.24	0.95	0.18	1.03	0.50
17	C017	-1.24	0.0	5.33	-0.23	0.91	0.29	0.89	0.82
44	C048	-2.32	0.0	-1.30	-0.23	0.88	0.34	1.05	1.61
106	V015	1.00	0.0	-2.22	-0.19	0.95	0.20	1.02	0.71
97	V006	0.86	0.0	1.71	-0.17	0.95	0.20	0.93	0.74
121	V030	1.14	0.0	0.30	-0.17	0.95	0.19	0.97	0.72
233	W007	4.55	0.0	-0.93	-0.14	0.96	0.16	1.00	0.67
180	V089	0.10	0.0	0.53	-0.12	0.95	0.23	1.04	0.74
56	C056	-4.20	0.0	-2.65	-0.12	0.82	0.50	1.01	0.40
163	V072	-1.48	0.0	-0.88	-0.12	0.94	0.30	0.97	0.66
33	C030	-2.32	0.0	4.43	-0.04	0.95	0.34	0.92	0.49
25	C025	0.10	0.0	-0.71	-0.03	0.96	0.23	1.00	0.73
133	V042	0.42	0.0	-0.44	-0.01	0.98	0.21	1.07	0.73
208	V117	-1.01	0.0	4.69	0.00	0.97	0.28	0.92	0.63
160	V069	-0.61	0.0	-0.65	0.02	0.98	0.26	1.02	0.70
58	C058	-2.32	0.0	0.38	0.03	0.97	0.34	0.93	0.52
166	V075	-2.01	0.0	3.98	0.04	0.98	0.32	0.85	0.49
213	V122	-1.24	0.0	-1.11	0.04	0.98	0.29	1.08	0.64
91	C091	-1.24	0.0	-0.45	0.06	0.99	0.29	0.97	0.66
164	V073	-1.24	0.0	-0.45	0.06	0.99	0.29	0.97	0.66
192	V101	-0.61	0.0	0.61	0.06	0.99	0.26	0.95	0.68
6	C006	0.26	0.00	-0.12	0.09	1.00	0.22	1.00	0.71
55	C055	-1.48	0.0	-0.88	0.10	1.00	0.30	0.97	0.64
178	V087	-0.06	0.00	0.99	0.11	1.01	0.24	0.97	0.71
23	C023	-0.61	0.01	0.20	0.13	1.01	0.26	1.01	0.68
141	V050	0.26	0.01	-0.95	0.14	1.01	0.22	1.11	0.70

TABLE CONTINUED

SERIAL ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	STD ERROR	DISC INDX	FIT TTEST
173	V082	-0.24	0.42	0.88	0.77
174	V083	2.17	0.35	0.92	-0.25
175	V084	-1.73	0.52	1.09	-1.08
176	V085	0.42	0.39	0.78	1.16
177	V086	0.10	0.40	0.65	1.97
178	V087	-0.06	0.41	0.97	0.11
179	V088	-1.48	0.50	1.00	-0.27
180	V089	0.10	0.40	1.04	-0.12
182	V091	-0.61	0.44	0.89	0.81
183	V092	-0.24	0.42	0.98	0.39
184	V093	-1.24	0.48	0.94	0.71
185	V094	-0.06	0.41	0.86	0.98
186	V095	-0.24	0.42	0.78	1.81
189	V098	2.30	0.35	0.69	1.03
190	V099	-0.61	0.44	1.04	-0.96
191	V100	-1.73	0.52	1.03	-0.96
192	V101	-0.61	0.44	0.95	0.06
193	V102	1.00	0.37	0.86	0.68
194	V103	0.10	0.40	0.65	2.39
195	V104	-1.48	0.50	1.05	-0.48
197	V106	-0.61	0.44	0.79	1.77
198	V107	-0.06	0.41	0.97	0.61
199	V108	-2.32	0.57	0.99	0.49
201	V110	-1.48	0.50	1.05	0.58
202	V111	-1.24	0.48	0.99	-0.25
203	V112	-0.42	0.43	0.76	2.11
204	V113	-2.01	0.54	1.01	0.73
205	V114	-2.01	0.54	1.07	0.53
207	V116	0.42	0.39	0.99	0.86
208	V117	-1.01	0.47	0.92	0.30
209	V118	-1.01	0.47	1.03	-0.98
210	V119	-0.80	0.45	1.03	-0.79
211	V120	-0.06	0.41	1.04	0.47
212	V121	-1.01	0.47	1.06	-1.16
213	V122	-1.24	0.48	1.08	0.04
214	V123	0.42	0.39	0.87	1.10
215	V124	-1.01	0.47	1.00	0.93
216	V125	-0.80	0.45	0.94	0.69
217	V126	-0.42	0.43	0.90	0.88
218	V127	-3.57	0.74	1.02	1.27
219	V128	-3.08	0.66	0.95	0.38
222	V131	-5.14	1.14	1.01	0.88
223	V132	-5.14	1.14	1.01	0.88
224	V133	-2.67	0.61	0.97	1.80
225	V134	-2.67	0.61	0.90	2.69
226	V135	-3.08	0.66	0.91	2.31
227	W001	4.29	0.36	1.03	-0.24
228	W002	3.54	0.35	1.12	-0.58
229	W003	3.78	0.35	1.09	-1.04
231	W005	3.16	0.32	1.26	-2.00
233	W007	4.55	0.36	1.00	-0.14

DIFFICULTY ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	DISC INDX	FIT TTEST
128	V037	0.10	1.06	-0.24
164	V077	0.10	0.69	1.87
130	V039	0.10	0.95	0.89
101	V101	-0.61	0.95	0.06
21	C121	-0.61	1.01	0.15
197	V100	-0.61	0.79	1.77
27	C027	-0.61	0.15	2.05
34	C034	-0.61	0.89	1.41
80	C080	-0.61	0.82	0.88
217	V126	-0.42	0.90	0.88
41	C041	-0.42	0.83	1.27
136	W079	-0.42	0.98	0.58
107	W040	-0.42	1.03	0.31
83	C085	-0.42	0.96	-0.79
34	C044	-0.42	0.88	0.77
33	C033	-0.42	0.94	0.77
19	C019	-0.42	0.39	0.48
20	C020	-0.42	0.92	0.81
95	V004	-0.42	1.03	0.31
126	V035	-0.42	1.02	-0.82
283	W061	-0.42	1.06	-1.36
203	W137	-0.42	0.76	2.11
295	W071	-0.42	1.13	-1.61
322	W095	-0.42	1.13	-1.14
136	V095	-0.24	0.78	1.81
193	V092	-0.24	0.98	0.39
173	V082	-0.24	0.84	0.77
312	W085	-0.24	0.97	-0.55
255	W028	-0.24	1.25	-2.85
264	W037	-0.24	1.25	-2.93
273	W046	-0.24	1.18	-2.30
69	C068	-0.06	1.08	-0.69
93	C090	-0.06	1.01	0.51
267	W340	-0.06	1.25	-2.81
185	V094	-0.06	0.86	0.98
34	C034	-0.06	0.84	1.63
10	C010	-0.06	0.97	0.59
60	C060	-0.06	0.69	2.67
178	V087	-0.06	0.97	0.11
87	C087	-0.06	0.82	1.56
38	C038	-0.06	0.75	1.47
211	V120	-0.06	1.04	0.47
194	V107	-0.06	0.97	0.61
177	V086	0.10	0.65	1.97
50	C050	0.10	0.85	1.17
301	W074	0.10	1.11	-1.01
3	C009	0.10	0.99	0.18
180	V089	0.10	1.04	-0.12
98	V007	0.10	0.74	1.26
104	V013	0.10	1.06	-1.16
4	C004	0.10	1.07	-0.34
127	V036	0.10	1.07	-0.70

FIT ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	T-TESTS TOTAL	WTD MNSQ	UNWTD MNSQ SD	DISC INDX	POINT BISER
67	C067	-3.08	0.01	-0.56	0.16	1.01	0.42	0.95	0.45
9	C009	0.10	0.01	-0.11	0.18	1.02	0.23	0.99	0.71
37	C037	-0.61	0.02	-1.99	0.21	1.03	0.26	0.98	0.68
247	W020	4.16	0.01	-0.64	3.22	1.03	0.19	0.94	0.51
306	W079	-0.42	0.02	3.22	0.28	1.05	0.25	0.98	0.65
45	C045	-1.73	0.03	-0.91	0.28	1.06	0.31	0.97	0.58
85	C085	-0.42	0.03	1.21	0.29	1.05	0.25	0.96	0.65
36	C036	-3.57	0.03	-2.30	0.29	1.06	0.48	1.02	0.45
172	V081	-1.01	0.03	-1.62	0.30	1.06	0.28	0.97	0.64
72	C072	-1.01	0.03	-0.94	0.30	1.06	0.28	1.00	0.65
95	V004	-0.42	0.03	-2.23	0.31	1.06	0.25	1.03	0.67
269	W042	1.79	0.02	-0.62	0.31	1.05	0.19	0.91	0.69
250	W023	4.42	0.02	-0.31	0.32	1.05	0.18	0.95	0.49
59	C059	-2.01	0.04	-2.19	0.33	1.07	0.32	1.01	0.58
92	V001	0.72	0.03	0.33	0.34	1.06	0.20	0.94	0.70
71	C071	-1.73	0.04	2.34	0.35	1.08	0.31	0.91	0.51
65	C065	-1.48	0.04	-0.88	0.35	1.08	0.30	0.97	0.62
242	W016	5.90	0.03	-0.64	0.36	1.06	0.23	0.98	0.32
245	W018	4.04	0.03	-0.44	0.36	1.06	0.19	0.94	0.53
219	V128	-3.08	0.05	-0.56	0.38	1.10	0.42	0.95	0.42
2	C002	1.41	0.03	-1.45	0.38	1.06	0.19	0.99	0.67
292	W065	1.92	0.03	-0.49	0.38	1.06	0.19	0.91	0.67
183	V092	-0.24	0.04	-1.07	0.39	1.08	0.24	0.98	0.68
49	C049	-1.24	0.05	-0.99	0.41	1.09	0.29	0.94	0.62
119	V028	1.00	0.04	-1.20	0.44	1.07	0.20	0.97	0.69
136	V045	1.79	0.04	0.99	0.44	1.07	0.19	1.06	0.67
234	W008	4.55	0.04	-1.19	0.46	1.07	0.18	0.96	0.46
211	V120	-0.06	0.05	-1.04	0.47	1.10	0.24	1.04	0.67
14	C014	-0.42	0.05	3.05	0.48	1.10	0.25	0.89	0.65
129	V038	2.79	0.04	1.44	0.49	1.08	0.19	0.89	0.57
197	V108	-2.32	0.07	-1.86	0.49	1.14	0.38	0.99	0.52
159	V068	0.72	0.04	-0.51	0.50	1.09	0.20	1.05	0.67
90	C090	-0.06	0.05	-1.35	0.51	1.11	0.24	1.01	0.67
205	V114	-2.01	0.07	-0.94	0.53	1.14	0.32	1.07	0.59
157	V066	0.26	0.05	-0.12	0.54	1.11	0.22	1.00	0.67
94	V003	1.27	0.05	2.22	0.56	1.10	0.19	0.87	0.70
61	C061	-1.01	0.07	4.56	0.57	1.14	0.28	0.81	0.59
201	V110	-1.48	0.07	-1.65	0.58	1.15	0.30	1.05	0.64
18	C018	-0.80	0.07	-1.96	0.58	1.14	0.27	1.00	0.66
10	C010	-0.06	0.06	0.18	0.59	1.13	0.24	0.97	0.66
198	V107	-0.06	0.06	-1.32	0.61	1.13	0.24	0.97	0.66
24	C024	0.26	0.06	0.66	0.62	1.12	0.22	0.87	0.67
116	V025	0.86	0.06	1.02	0.63	1.12	0.20	0.99	0.70
156	V065	0.86	0.06	-1.12	0.65	1.12	0.20	0.91	0.67
216	V125	-0.80	0.08	1.00	0.69	1.17	0.27	0.94	0.62
189	V098	-1.24	0.09	-0.99	0.71	1.19	0.29	0.94	0.59
204	V113	-2.01	0.10	-2.19	0.73	1.21	0.32	1.01	0.56
74	C074	-2.67	0.12	-2.89	0.74	1.25	0.37	0.97	0.51
97	V008	0.72	0.07	3.58	0.74	1.14	0.20	0.78	0.67
109	V018	1.41	0.07	0.11	0.74	1.14	0.19	0.88	0.65
82	C082	-1.73	0.10	-0.91	0.76	1.22	0.31	0.97	0.56

TABLE CONTINUED

Table 2. Continued

SERIAL ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	STD ERROR	DISC INDX	FIT TTEST
234	W008	4.55	0.36	0.96	0.46
235	W009	3.54	0.35	1.17	-1.10
236	W010	4.42	0.36	1.07	-0.59
237	W011	4.04	0.36	0.85	1.34
238	W012	4.16	0.36	1.11	-1.30
239	W013	5.55	0.40	0.98	-0.29
241	W015	3.78	0.35	1.19	-1.48
242	W016	5.90	0.41	0.98	0.36
243	W017	3.78	0.35	1.09	-0.68
245	W018	4.04	0.36	0.94	0.36
247	W020	4.16	0.36	0.94	0.22
248	W021	4.04	0.36	1.12	-1.34
250	W023	4.42	0.36	0.95	0.32
252	W025	1.00	0.37	1.17	-1.21
253	W026	0.86	0.38	1.25	-2.01
254	W027	0.72	0.38	1.23	-2.10
255	W028	-0.24	0.42	1.25	-2.85
256	W029	0.57	0.39	1.16	-0.83
257	W030	0.72	0.38	1.22	-2.19
258	W031	2.79	0.35	1.28	-1.45
259	W032	1.54	0.36	1.20	-1.19
260	W033	2.67	0.35	1.33	-1.36
261	W034	3.41	0.35	1.20	-1.62
262	W035	0.42	0.39	1.19	-1.37
264	W037	-0.24	0.42	1.25	-2.95
265	W038	0.42	0.39	1.24	-2.06
266	W039	1.92	0.36	1.24	-1.16
267	W040	-0.06	0.41	1.25	-2.61
269	W042	1.79	0.36	0.91	0.31
270	W043	2.55	0.35	1.11	-0.24
271	W044	2.05	0.36	1.16	-0.50
272	W045	3.16	0.35	1.14	-0.49
273	W046	-0.24	0.42	1.18	-2.30
274	W047	0.26	0.40	1.23	-2.33
275	W048	-1.01	0.47	1.11	-1.75
276	W049	1.54	0.36	1.15	-1.04
277	W050	0.26	0.40	1.27	-2.67
278	W051	1.27	0.37	1.11	-0.51
281	W054	0.42	0.39	1.10	-1.00
282	W055	1.14	0.37	1.37	-2.47
283	W056	1.41	0.36	1.28	-1.64
284	W057	0.10	0.40	1.22	-1.47
285	W058	1.67	0.36	1.39	-1.44
286	W059	0.42	0.39	1.24	-1.78
287	W060	0.10	0.40	1.18	-1.68
288	W061	-0.42	0.43	1.06	-1.36
289	W062	3.29	0.35	1.23	-2.16
290	W063	1.14	0.37	1.26	-0.96
291	W064	0.42	0.39	0.99	-0.43
292	W065	1.92	0.36	0.91	0.38
293	W066	1.67	0.36	1.14	-1.23

DIFFICULTY ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	DISC INDX	FIT TTEST
147	V096	0.86	1.05	-0.33
102	V011	0.86	1.20	-0.61
107	V016	0.86	0.36	1.08
108	V017	0.86	1.11	-0.38
252	W029	1.00	1.17	-1.21
106	V015	1.00	1.02	-0.19
135	V044	1.00	1.02	-0.34
122	V031	1.00	0.74	1.43
149	V058	1.00	1.09	-0.68
119	V028	1.00	0.97	0.44
132	V041	1.00	0.92	0.98
193	V102	1.00	0.36	0.88
125	V034	1.14	0.75	0.83
121	V030	1.14	0.97	-0.17
242	W055	1.14	1.37	-2.47
290	W063	1.14	1.26	-0.96
140	V057	1.14	1.20	-1.03
134	V043	1.27	0.94	0.95
278	W051	1.27	1.11	-0.51
94	V003	1.27	0.87	0.56
131	V040	1.41	1.10	-0.28
309	W082	1.41	1.35	-1.82
144	V053	1.41	0.37	2.45
109	V018	1.41	0.96	0.74
2	C002	1.41	0.99	0.38
283	W056	1.41	1.28	-1.64
100	V009	1.41	1.11	-0.63
276	W049	1.54	1.15	-1.04
259	W032	1.54	1.20	-1.19
3	C003	1.54	1.27	-1.34
22	C022	1.67	0.83	1.07
285	W058	1.67	1.39	-1.44
293	W066	1.67	1.14	-1.23
7	C007	1.67	1.25	-1.59
11	C011	1.67	1.14	-1.10
117	V026	1.67	1.01	-0.42
136	V045	1.79	1.06	0.44
269	W042	1.79	0.91	0.31
266	W039	1.92	1.24	-1.16
292	W065	1.92	0.91	0.38
139	V048	1.92	0.76	1.04
103	V012	1.92	1.02	-0.35
271	W044	2.05	1.16	-0.50
174	V083	2.17	0.92	-0.85
189	V098	2.30	0.69	1.03
114	V023	2.30	0.68	2.12
146	V055	2.55	0.77	1.60
270	W043	2.55	1.11	-0.24
260	W033	2.67	1.33	-1.36
258	W031	2.79	1.28	-1.45
129	V038	2.79	0.89	0.49

FIT ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	T-TESTS TOTAL	WTD MNSQ	UNWSQ SD	DISC INDX	POINT BISER
33	C033	-0.42	0.09	1.01	0.77	1.18	0.25	0.94	0.65
173	V082	-0.24	0.09	0.96	0.77	1.16	0.24	0.88	0.66
29	C029	-1.48	0.10	-1.49	0.77	1.21	0.30	1.00	0.69
81	C081	-2.01	0.11	-3.96	0.80	1.24	0.32	0.88	0.67
20	C020	-0.42	0.09	-0.63	0.81	1.19	0.25	0.93	0.63
182	V091	-0.61	0.10	1.05	0.81	1.20	0.26	0.89	0.63
142	V051	0.57	0.08	0.78	0.81	1.16	0.21	0.93	0.66
125	V034	1.14	0.08	2.47	0.83	1.16	0.19	0.75	0.65
57	C057	-1.24	0.11	-0.45	0.84	1.23	0.29	0.97	0.60
207	V116	0.42	0.09	-0.97	0.86	1.18	0.21	0.99	0.65
223	V132	-5.18	0.25	-3.03	0.88	1.57	0.80	1.01	0.15
193	V102	1.00	0.08	1.09	0.88	1.17	0.20	0.86	0.66
222	V131	-5.18	0.25	-3.03	0.88	1.57	0.80	1.01	0.15
86	C086	-0.61	0.11	1.22	0.88	1.22	0.26	0.82	0.61
217	V126	-0.42	0.10	0.94	0.88	1.22	0.25	0.90	0.62
130	V039	0.10	0.09	-0.42	0.89	1.20	0.23	0.95	0.65
88	C088	-1.01	0.11	1.11	0.90	1.24	0.28	0.99	0.59
62	C062	-1.48	0.13	-1.40	0.93	1.27	0.30	1.00	0.61
215	V124	-1.01	0.12	-0.94	0.93	1.25	0.28	1.00	0.60
134	V043	1.27	0.09	1.11	0.95	1.18	0.19	0.94	0.68
132	V041	1.00	0.09	0.88	0.98	1.19	0.20	0.92	0.66
185	V094	-0.06	0.11	0.37	0.98	1.23	0.24	0.86	0.64
73	C073	0.26	0.11	-0.39	1.01	1.22	0.22	0.91	0.63
189	V098	2.30	0.09	0.13	1.03	1.20	0.19	0.69	0.59
139	V048	1.92	0.09	1.32	1.04	1.20	0.19	0.76	0.65
161	V070	-1.01	0.13	-0.50	1.04	1.29	0.28	0.91	0.57
70	C070	-0.80	0.13	0.65	1.06	1.28	0.27	0.85	0.62
14	C014	0.26	0.11	-0.37	1.06	1.23	0.22	0.91	0.63
43	C043	0.42	0.11	-0.30	1.06	1.23	0.21	0.91	0.65
22	C022	1.67	0.10	0.43	1.07	1.20	0.19	0.83	0.60
107	V016	0.86	0.10	-0.70	1.08	1.22	0.20	0.86	0.65
214	V123	0.42	0.11	0.43	1.10	1.24	0.21	0.87	0.65
176	V085	0.42	0.12	0.68	1.16	1.25	0.21	0.78	0.65
50	C050	0.10	0.13	1.73	1.17	1.27	0.23	0.85	0.65
113	V022	0.72	0.11	-1.36	1.18	1.24	0.20	0.90	0.64
53	C053	-0.80	0.15	0.15	1.19	1.33	0.27	0.91	0.59
68	C068	-2.32	0.19	0.38	1.20	1.42	0.34	0.93	0.47
94	V003	0.10	0.14	-3.48	1.26	1.30	0.23	0.74	0.61
218	V127	-3.57	0.28	-2.30	1.27	1.63	0.48	1.02	0.38
41	C041	-0.42	0.15	0.63	1.27	1.33	0.25	0.83	0.59
75	C075	-1.48	0.18	-0.31	1.29	1.40	0.30	0.91	0.51
237	W011	4.04	0.12	0.77	1.34	1.26	0.19	0.85	0.51
28	C028	-0.61	0.18	1.57	1.4.	1.39	0.26	0.89	0.59
122	V031	1.00	0.14	0.91	1.43	1.29	0.20	0.74	0.62
111	V020	0.57	0.15	0.15	1.43	1.31	0.21	0.85	0.42
79	C079	-1.01	0.19	0.82	1.45	1.43	0.28	0.85	0.53
38	C038	-0.06	0.17	2.01	1.47	1.36	0.24	0.75	0.58
84	C084	-1.73	0.23	3.22	1.52	1.50	0.31	0.87	0.44
77	C077	-1.01	0.20	2.42	1.52	1.45	0.28	0.87	0.51
83	C083	0.10	0.17	1.58	1.52	1.37	0.23	0.84	0.59
87	C087	-0.06	0.18	0.10	1.56	1.39	0.24	0.82	0.58

TABLE CONTINUED

SERIAL ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	STD ERROR	DISC INDX	FIT TTEST
295	W068	0.72	0.38	1.24	-1.76
297	W070	-1.24	0.48	1.02	-0.57
298	W071	-0.42	0.43	1.13	-1.61
299	W072	-1.01	0.47	1.06	-0.96
301	W074	0.10	0.40	1.11	-1.01
302	W075	-1.01	0.47	1.06	-0.38
306	W079	-0.42	0.43	0.98	0.29
307	W080	-0.42	0.43	1.03	-0.79
309	W082	1.41	0.36	1.35	-1.82
310	W083	-1.48	0.50	1.05	-1.07
312	W085	-0.24	0.42	0.97	-0.55
313	W086	-1.24	0.48	1.08	-1.59
314	W087	-1.48	0.50	1.11	-1.58
315	W088	-1.73	0.52	1.09	-2.13
316	W089	-1.48	0.50	1.05	-0.84
317	W090	-1.24	0.48	1.09	-1.20
318	W091	-1.01	0.47	1.17	-2.64
319	W092	-1.73	0.52	1.09	-2.13
320	W093	-1.48	0.50	1.11	-2.11
321	W394	-1.01	0.47	1.03	-0.37
322	W095	-0.42	0.43	1.13	-1.14
	MEAN	0.00		1.01	-0.08
	S.D.	1.76		0.14	1.16

DIFFICULTY ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	DISC INDX	FIT TTEST
272	W045	3.16	1.14	-0.49
231	W005	3.16	1.26	-2.00
289	W062	3.29	1.23	-2.16
261	W034	3.41	1.20	-1.62
235	W009	3.54	1.17	-1.10
228	W002	3.54	1.12	-0.58
243	W017	3.78	1.09	-0.68
229	W003	3.78	1.09	-1.04
241	W015	3.78	1.19	-1.48
248	W021	4.04	1.12	-0.92
237	W011	4.04	0.85	1.34
245	W018	4.04	0.94	0.36
238	W012	4.16	1.11	-1.30
247	W020	4.16	0.94	0.22
227	W001	4.29	1.03	-0.24
250	W023	4.42	0.95	0.32
236	W010	4.42	1.07	-0.59
234	W008	4.55	0.96	0.46
233	W007	4.55	1.00	-0.14
239	W013	5.55	0.98	-0.29
242	W016	5.90	0.98	0.36

FIT ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	T-TESTS TOTAL	WTD MNSQ	UNWSQ SD	DISC INDX	POINT BISER
167	V076	-1.01	0.21	0.82	1.58	1.47	0.28	0.85	0.53
146	V055	2.55	0.15	0.19	1.60	1.33	0.19	0.77	0.58
34	C034	-0.06	0.19	0.83	1.63	1.41	0.24	0.83	0.59
44	C044	-0.42	0.21	3.62	1.73	1.48	0.25	0.68	0.52
197	V106	-0.61	0.23	-1.29	1.77	1.51	0.28	0.79	0.54
224	V133	-2.67	0.33	-1.29	1.80	1.77	0.37	0.97	0.40
186	V095	-0.24	0.22	1.54	1.81	1.48	0.24	0.78	0.58
82	C082	-2.01	0.30	1.12	1.86	1.68	0.32	0.86	0.41
168	V077	0.10	0.21	1.37	1.87	1.47	0.23	0.69	0.59
51	C051	-1.24	0.26	1.33	1.87	1.60	0.29	0.85	0.49
110	V019	0.57	0.20	-0.29	1.90	1.43	0.21	0.81	0.57
177	V086	0.10	0.22	2.75	1.97	1.50	0.25	0.65	0.47
170	V079	0.42	0.22	1.90	2.01	1.48	0.21	0.70	0.57
27	C027	-0.61	0.27	0.82	2.05	1.61	0.26	0.83	0.52
203	V112	-0.42	0.27	1.86	2.11	1.60	0.25	0.76	0.50
114	V023	2.30	0.20	1.18	2.12	1.45	0.19	0.68	0.57
226	V135	-3.08	0.48	-0.56	2.31	2.20	0.42	0.95	0.29
194	V103	0.10	0.28	2.75	2.39	1.63	0.23	0.65	0.53
144	V053	1.41	0.24	2.42	2.45	1.53	0.19	0.37	0.56
60	C060	-0.06	0.32	2.50	2.67	1.74	0.24	0.69	0.47
225	V134	-2.67	0.51	1.17	2.69	2.29	0.37	0.90	0.28
				-0.05	-0.08	1.00	0.26		
				1.47	1.16	0.30	0.08		

275 ITEMS CALIBRATED ON 69 PERSONS
69 MEASURABLE PERSONS WITH MEAN ABILITY = 2.31 AND STD. DEV. = 2.69

Table 3- Analysis of Fit for Emory Word Analysis Skill Inventory, Form A

FIT ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	T-TESTS TOTAL	WTD MNSQ	MNSQ SD	DISC INDX	POINT BISER
204	V113	0.76	0.0	1.61	-2.47	0.64	0.16	2.74	0.77
48	C048	0.52	0.0	1.74	-2.44	0.65	0.16	2.77	0.77
91	C091	0.52	0.0	0.97	-2.20	0.68	0.16	2.33	0.73
208	V117	0.52	0.0	0.97	-1.96	0.71	0.16	2.33	0.67
50	C050	0.28	0.0	1.05	-1.96	0.70	0.17	2.41	0.70
238	W012	0.52	0.0	1.74	-1.73	0.74	0.16	2.77	0.66
105	V014	0.04	0.0	1.42	-1.63	0.72	0.18	2.54	0.65
69	C069	0.52	0.0	0.32	-1.50	0.77	0.16	1.89	0.63
67	C067	0.28	0.0	1.05	-1.46	0.77	0.17	2.41	0.62
73	C073	1.80	0.0	0.60	-1.39	0.66	0.26	2.18	0.69
53	C053	1.52	0.0	0.34	-1.28	0.73	0.22	2.01	0.61
166	V075	0.52	0.0	0.97	-1.24	0.81	0.16	2.33	0.56
106	V015	-0.22	0.0	0.80	-1.16	0.77	0.21	2.26	0.58
86	C086	0.04	0.0	0.37	-1.03	0.81	0.18	1.62	0.54
164	V073	0.52	0.0	0.32	-1.00	0.84	0.16	1.89	0.52
269	W042	1.52	0.0	0.53	-0.99	0.78	0.22	1.52	0.55
289	W062	1.52	0.0	0.53	-0.99	0.78	0.22	1.52	0.55
284	W057	0.76	0.0	1.64	-0.94	0.85	0.16	1.85	0.54
268	W041	1.80	0.0	-0.04	-0.91	0.76	0.26	1.65	0.58
85	C085	0.76	0.0	-2.09	-0.87	0.86	0.16	0.97	0.52
47	C047	-0.22	0.0	-0.02	-0.86	0.82	0.21	1.77	0.51
71	C071	0.76	0.0	0.00	-0.84	0.86	0.16	1.86	0.48
311	W084	1.25	0.0	0.56	-0.79	0.84	0.19	1.91	0.53
308	W081	0.76	0.0	0.11	-0.79	0.87	0.16	1.41	0.52
261	W034	1.00	0.0	-0.69	-0.71	0.87	0.17	1.41	0.49
45	C045	0.04	0.0	0.45	-0.68	0.87	0.18	2.08	0.47
161	V070	0.04	0.0	0.18	-0.66	0.87	0.18	1.61	0.46
87	C087	0.28	0.0	-0.91	-0.64	0.89	0.17	1.06	0.47
103	V012	-0.22	0.0	1.13	-0.61	0.86	0.21	1.76	0.46
70	C070	1.25	0.0	-0.89	-0.60	0.88	0.19	1.45	0.46
2	C002	-0.50	0.0	0.19	-0.59	0.84	0.25	1.99	0.52
207	V116	1.00	0.0	0.18	-0.58	0.89	0.17	1.86	0.44
202	V111	0.04	0.0	0.45	-0.52	0.90	0.18	2.08	0.44
46	C046	0.04	0.0	-1.84	-0.50	0.90	0.18	1.15	0.44
43	C043	-0.82	0.0	-0.40	-0.48	0.83	0.31	1.72	0.47
265	W038	1.52	0.0	0.53	-0.47	0.88	0.22	1.52	0.45
38	C038	-1.20	0.0	0.51	-0.47	0.78	0.40	2.15	0.55
291	W064	1.52	0.0	0.53	-0.42	0.89	0.22	1.52	0.46
312	W085	1.00	0.0	0.48	-0.32	0.94	0.17	0.96	0.38
287	W060	1.25	0.0	1.20	-0.27	0.94	0.19	1.44	0.44
286	W059	1.25	0.0	1.20	-0.27	0.94	0.19	1.44	0.44
92	V001	-1.68	0.0	-0.02	-0.20	0.80	0.55	2.00	0.51
210	V119	1.52	0.0	-1.86	-0.19	0.94	0.22	1.04	0.33
277	W050	-0.82	0.0	-0.40	-0.19	0.91	0.31	1.72	0.35
74	C074	1.80	0.0	-0.99	-0.19	0.93	0.26	1.14	0.31
237	W011	0.04	0.0	0.18	-0.18	0.96	0.18	1.61	0.36
298	W071	-1.20	0.0	-0.80	-0.15	0.89	0.40	1.41	0.38
1	C001	-0.82	0.0	0.10	-0.13	0.93	0.31	1.11	0.36
309	W082	0.76	0.0	0.11	-0.11	0.97	0.16	1.41	0.37
3	C003	-0.82	0.0	0.10	-0.04	0.96	0.31	1.11	0.33
192	V101	-0.82	0.0	0.10	-0.02	0.96	0.31	1.11	0.30
160	V069	0.28	0.0	-0.65	-0.01	0.99	0.17	1.51	0.34
10	C010	-0.22	0.0	-1.42	-0.01	0.98	0.21	0.78	0.30
168	V077	1.25	0.0	1.10	0.01	0.99	0.19	0.53	0.31
217	V126	2.50	0.0	-0.64	0.01	0.95	0.41	1.54	0.37
117	V026	2.50	0.0	-0.64	0.01	0.95	0.41	1.54	0.37
270	W043	2.50	0.0	0.64	0.01	0.95	0.41	0.84	0.32
19	C019	-0.22	0.0	0.55	0.02	0.99	0.21	1.28	0.31
31	C031	-0.82	0.0	0.10	0.02	0.97	0.31	1.11	0.28
14	C014	-1.20	0.0	-0.80	0.03	0.96	0.40	1.41	0.31
30	C030	-1.20	0.0	0.75	0.09	0.98	0.40	0.68	0.24
29	C029	-1.20	0.0	0.75	0.09	0.98	0.40	0.68	0.24
28	C028	-1.20	0.0	0.35	0.13	1.00	0.40	0.66	0.17
37	C037	-0.82	0.00	1.62	0.13	1.01	0.31	-0.13	0.20
81	C081	-0.82	0.01	1.62	0.14	1.01	0.31	0.50	0.23
12	C012	-1.20	0.01	0.75	0.17	1.02	0.40	0.68	0.18
58	C058	-1.20	0.01	0.75	0.17	1.02	0.40	0.68	0.18
174	V083	3.00	0.0	-0.53	0.18	1.00	0.55	1.11	0.28
36	C036	-0.50	0.01	1.28	0.18	1.03	0.25	0.36	0.21
93	V002	-2.45	0.0	-0.66	0.20	0.92	0.88	1.86	0.31
33	C033	-1.68	0.00	0.82	0.20	1.01	0.55	-0.03	0.02
98	V007	-1.68	0.01	-0.47	0.21	1.02	0.55	0.99	0.19
94	V003	-2.45	0.0	-0.66	0.23	0.94	0.88	1.86	0.27
271	W044	3.78	0.0	-0.54	0.24	0.95	0.87	1.87	0.27
189	V098	3.78	0.0	-0.54	0.25	0.96	0.87	1.87	0.25

Table 3, continued

FIT ORDER

SEQ NUM	ITEM NAME	ITEM DIFF	ERR IMPAC	FIT BETWN	T-TESTS TOTAL	WTD MNSQ	MNSQ SD	DISC INDX	POINT BISER
121	V030	3.78	0.0	-0.54	0.25	0.96	0.87	1.87	0.25
126	V035	3.78	0.0	-0.54	0.25	0.96	0.87	1.87	0.25
176	V085	3.78	0.0	-0.54	0.25	0.96	0.87	1.87	0.25
150	V059	-1.20	0.02	0.35	0.26	1.05	0.40	0.66	0.12
25	C025	-0.82	0.02	-0.73	0.26	1.05	0.31	0.49	0.13
41	C041	-0.82	0.03	1.62	0.29	1.06	0.31	-0.13	0.10
193	V102	-1.68	0.03	-0.47	0.29	1.06	0.55	0.99	0.09
236	W010	-0.22	0.02	-1.42	0.30	1.05	0.21	0.78	0.22
100	V009	-1.20	0.03	0.35	0.30	1.07	0.40	0.66	0.05
80	C080	-0.82	0.03	0.58	0.31	1.07	0.31	-0.12	0.11
77	C077	-0.82	0.03	0.58	0.31	1.07	0.31	-0.12	0.11
159	V068	-0.50	0.03	-1.07	0.32	1.06	0.25	0.91	0.20
294	W067	2.50	0.04	0.64	0.32	1.08	0.41	0.84	0.21
313	W086	-0.82	0.04	0.10	0.33	1.07	0.31	1.11	0.16
297	W070	-2.45	0.03	0.79	0.35	1.05	0.88	0.04	-0.03
251	W024	-1.20	0.05	0.14	0.36	1.09	0.40	-0.08	0.01
5	C005	-0.82	0.04	-0.73	0.36	1.08	0.31	0.49	0.15
13	C013	-2.45	0.03	0.79	0.36	1.06	0.88	0.04	-0.07
152	V061	-1.68	0.06	0.82	0.39	1.12	0.55	-0.03	-0.08
155	V064	-1.68	0.06	0.82	0.39	1.12	0.55	-0.03	-0.08
156	V065	-1.68	0.06	0.82	0.39	1.12	0.55	-0.03	-0.08
255	W028	-0.82	0.05	0.58	0.40	1.10	0.31	-0.12	0.10
75	C075	-0.82	0.05	0.58	0.42	1.10	0.31	-0.12	0.09
321	W094	-0.22	0.04	-1.42	0.45	1.08	0.21	0.78	0.19
233	W007	-0.50	0.05	-0.36	0.46	1.10	0.25	0.37	0.14
55	C055	-0.82	0.06	0.58	0.46	1.12	0.31	-0.12	0.07
57	C057	-1.20	0.07	0.14	0.48	1.14	0.40	-0.08	-0.02
173	V082	2.50	0.07	-0.23	0.48	1.15	0.41	0.15	-0.02
260	W033	-0.82	0.06	-0.73	0.49	1.12	0.31	0.49	0.06
4	C004	0.04	0.04	-0.11	0.51	1.08	0.18	0.21	0.20
16	C016	-1.20	0.08	0.75	0.53	1.17	0.40	0.68	-0.03
59	C059	-1.20	0.08	0.14	0.54	1.17	0.40	-0.08	-0.05
258	W031	-0.50	0.06	2.32	0.54	1.12	0.25	0.38	0.13
83	C083	-0.82	0.07	0.58	0.57	1.15	0.31	-0.12	-0.02
15	C015	-0.82	0.08	0.58	0.59	1.16	0.31	-0.12	-0.02
229	W003	-0.50	0.06	-0.36	0.60	1.13	0.25	0.37	0.08
23	C023	0.04	0.05	-0.25	0.62	1.10	0.18	0.68	0.18
198	V107	-0.50	0.07	-0.36	0.67	1.15	0.25	0.37	0.04
64	C064	-0.82	0.09	0.58	0.70	1.20	0.31	-0.12	-0.02
282	W055	0.04	0.06	0.20	0.73	1.13	0.18	0.67	0.15
275	W048	-0.22	0.07	0.38	0.74	1.15	0.21	0.27	0.09
274	W047	-0.22	0.07	0.38	0.74	1.15	0.21	0.27	0.09
7	C007	-1.20	0.13	2.44	0.74	1.27	0.40	-1.56	-0.25
228	W002	-0.82	0.10	0.58	0.76	1.22	0.31	-0.12	-0.07
300	W073	-0.82	0.11	1.56	0.80	1.23	0.31	-0.74	-0.10
316	W089	0.04	0.07	-0.11	0.81	1.14	0.18	0.21	0.14
34	C034	-0.50	0.09	0.87	0.83	1.20	0.25	-0.18	-0.04
157	V066	-0.82	0.13	0.58	0.91	1.27	0.31	-0.12	-0.14
320	W093	-0.50	0.11	2.32	0.95	1.23	0.25	0.38	-0.02
259	W032	-0.50	0.11	1.43	0.97	1.24	0.25	-0.71	-0.08
227	W001	-0.50	0.12	1.43	1.01	1.25	0.25	-0.71	-0.08
199	V108	-0.50	0.14	1.29	1.14	1.29	0.25	-0.16	-0.12
61	C061	-0.50	0.14	1.43	1.17	1.30	0.25	-0.71	-0.13
195	V104	0.04	0.12	0.92	1.31	1.24	0.18	-0.25	0.00
280	W053	0.04	0.12	1.45	1.40	1.26	0.18	-0.26	-0.02
257	W030	-0.22	0.21	2.83	1.99	1.46	0.21	-1.20	-0.28
				0.33	-0.05	0.99	0.32		
				0.89	0.79	0.16	0.18		

Appendix A- Original Inventory With Objectives

Upper Case Letters

Objective: The student will recognize upper case letters.

C H F I K Y M N S P Q G U A E L
T X V Z B R D J O

Numerals

Objective: The student will recognize numerals.

1 3 2 7 6 4 8 5 9

Lower Case Letters

Objective: The student will recognize lower case letters.

k t b x i c r v n d f e a y g u
m o w p l z q

Letter-Sound Associations

Objective: The student will demonstrate knowledge of beginning sounds of words, given the first letter.

Dd Mm Aa Nn Ff Rr Ss Ll Oo Yy Bb Pp Tt
Cc Hh Vv Gg Ii Uu Zz Jj

Initial Consonants

Objective: The student will demonstrate knowledge of initial consonant sounds.

(Pictures were presented of the following):

Snake Girl Dog Pie Wagon Television Apple Bat Nest
Cup Fish Hammer Mop Rocket Valentine

Interchange of Beginning and Ending Letters

Objective: The student will recognize that the same letters are interchangeable to form different words.

rat ran Nat mat man pat pan fan cat can fat

Short Vowel Sounds (Remained in Final Calibration)

Objective: The student will demonstrate ability to recognize short vowel sounds of initial blends.

trap swim strap bled brag flat snap
skunk shred spot split scrub crib sled
grab graph spring

Appendix A, continued

Short Vowel Sounds

Objective: The student will demonstrate ability to recognize short vowel sounds in one syllable words.

tan tin rot rut ten pat fin pit pet

Final Blends and Double Consonants

Objective: The student will demonstrate knowledge of the sounds of final blends and final double consonants.

dump	kiss	rest	hunt	soft	belt	slept
risk	gulp	splints	mend	bent	farm	cuff
silk	stumps	lifts	spill	wasp	part	

Consonant Digraphs

Objective: The student will demonstrate knowledge of the sounds of consonant digraphs.

fish	what	shut	chop	that	them	path	harsh
thumb	chick	shark	hang	witch	lunch	half	lung
thank	chart	whip	dumb				

Magic E

Objective: The student will demonstrate knowledge of the use of "e" at the end of one syllable words.

tape	cute	mate	snake	fate	code	vane	cone
rule	lime	hope	kite	June	fine	Pete	rate
chase	plate	wine	tube	phone	note	grime	size
cape	duke						

R Controls

Objective: The student will demonstrate knowledge of r controlled words.

sir	fern	fur	worm	turn	world	third	lord
jerk	curb						

L and N Patterns

Objective: The student will demonstrate knowledge of the sounds of L and N (l and n) in words.

child	think	bolt	kind	gold	strong	string	scold
tall	find	bald	wild	shrink			

Appendix A, continued

-igh Patterns

Objective: The student will demonstrate knowledge of the -igh sound in words.

right night flight high sigh

Vowel Combinations

Objective: The student will demonstrate knowledge of vowel combinations.

oil	dawn	toe	fail	blood	buy	sour	chews	cream
haul	few	seal	spray	rain	mean	die	sleep	head
crook	goes	groan	house	beat	shout	haunt	key	suit
pour	soup	draw	boil	nail	ouch	throws	pies	quack
soil	soul	mow	hoax	paid	oak			

Compound Words

Objective: The student will demonstrate the ability to pronounce a compound word.

sidewalk	taxicab	baseball	classroom	grandmother
lipstick	rocketship	earthquake	basketball	southeast

Inflectional Endings

Objective: The student will demonstrate ability to add the sound of an inflectional ending to a word.

hopped	bigger	catches	dresses	hoping	hugging
closed	cuter	filing	singing	ended	fastest
riding	rated	boxing	wagged	dried	

C and G Patterns

Objective: The student will demonstrate knowledge of sounds of the letters C and G (c and g) in words.

page	gem	huge	ugly	trace	camera	cigar	cent
cable	guest	fringe					

Suffixes

Objective: The student will demonstrate the ability to pronounce roots with suffixes.

action	musical	slowly	division	agreeable	sensible
gradual	poisonous	graceful	native	official	breakable
retirement	bendable	faithful	madness	facial	ability
thickness	simplify	pollution	tension	talkative	

Appendix A, continued

Prefixes

Objective: The student will demonstrate the ability to pronounce roots with prefixes.

subhuman	informal	removal	inhuman	misspell
enclosed	dismissal	unintentional	misdirect	precautionary
ultraviolet	renew	untie	subway	nonsense
inexpensive	dislike	supervision	intercity	inexact
unnatural	unconscious			

Vowel Sounds

Objective: The student will demonstrate knowledge of short and long vowel sounds in words usually thought to be unfamiliar to the student.

shard	shun	mesh	gust	pox	winch	wend
yen	shod	quip	nib	quest	fend	skiff
sop	null	nub	stint	pip	bog	shrug
mime	truce	brad	bade	fie	rue	crone
lush	mace	bide	leek	node	fume	jot
cusp	hasp	gel	vat	dram	lull	plat
probe	opt	nape	deem	eke	strafe	hilt
cog	cud	twill	cad	nab	sprig	grog
cult	quill					

Multisyllable Words

Objective: The student will be able to analyze, decode, and synthesize multisyllable words.

inconsequential	rationalization	quagmire
anthropological	polarity	photosynthesis
tachometer	conscientious	procrastinate
philanthropist	anatomical	inexplicable
parenthetically	implementation	apprciate
incipient	discrepancy	suspicious
calisthenics	variability	anatomical
abominable	familiarity	ornithology

Note: "anatomical" appeared twice in the scale. It was later found that the replication produced identical item difficulty and fit to the word analysis skill variable.

Appendix B- Item Characteristics By Subscale

ITEM NAME	ITEM	d_i	$Se(d_i)$	68%CI for d_i
1. Consonant Digraphs (Consonant Subgroup)				
C035	fish	misfit		misfit
C036	what	-3.57	0.74	-4.31,-2.83
C037	shut	-0.61	0.44	-1.05,-0.17
C038	chop	-0.06	0.41	-0.47, 0.35
C039	that	-3.57	0.74	-4.31,-2.83
C040	them	-3.57	0.74	-4.31,-2.83
C041	path	-0.42	0.43	-0.85, 0.01
C042	harsh	misfit		misfit
C043	thumb	0.42	0.39	0.03, 0.81
C044	chick	-0.42	0.43	-0.85, 0.01
C045	shark	-1.73	0.52	-2.25,-1.21
C046	hang	-1.24	0.48	-1.72,-0.76
C047	witch	-1.01	0.47	-1.48,-0.64
C048	lunch	-2.32	0.57	-2.89,-1.65
C049	half	-1.24	0.48	-1.72,-0.76
C050	lung	0.10	0.40	-0.30, 0.50
C051	thank	-1.24	0.48	-1.72,-0.76
C052	chart	-1.01	0.47	-1.48,-0.54
C053	whip	-0.80	0.45	-1.25,-0.35
C054	dumb	misfit		misfit
2. Final Blends and Double Consonants				
C055	dump	-1.48	0.50	-1.98,-0.98
C056	kiss	misfit		misfit
C057	rest	-1.24	0.48	-1.72,-0.76
C058	hunt	-2.32	0.57	-2.89,-1.75
C059	soft	-2.01	0.54	-2.55,-1.47
C060	bent	misfit		misfit
C061	slept	-1.01	0.47	-1.48,-0.54
C062	risk	-1.48	0.50	-1.98,-0.98
C063	gulp	0.26	0.40	-0.14, 0.66
C064	splints	0.10	0.40	-0.30, 0.50
C065	mend	-1.48	0.50	-1.98,-0.98
C066	bent	misfit		misfit
C067	farm	-3.08	0.66	-3.74,-2.42
C068	cuff	-2.32	0.57	-2.89,-1.75
C069	silk	-0.06	0.41	-0.47, 0.35
C070	stumps	-0.80	0.45	-1.25,-0.35
C071	lifts	-1.73	0.52	-2.25,-1.21
C072	spill	-1.01	0.47	-1.48,-0.74
C073	wasp	0.26	0.40	-0.14, 0.66
C074	part	-2.67	0.61	-3.28,-2.06
3. R Controls				
C025	sir	0.10	0.40	-0.30, 0.50
C026	fern	misfit		misfit
C027	fur	misfit		misfit

Appendix B, continued

ITEM NAME	ITEM	d_i	$Se(d_i)$	68%CI for d_i
C028	worm	-0.61	0.44	-1.05,-0.17
C029	turn	-1.48	0.50	-1.98,-0.98
C030	word	-2.32	0.57	-2.89,-1.75
C031	third	-2.01	0.54	-2.55,-1.47
C032	lord	-2.01	0.54	-2.55,-1.47
C033	jerk	-0.42	0.43	-0.85, 0.01
C034	curb	-0.06	0.41	-0.47, 0.35
4. Initial Blends				
C075	trap	-1.48	0.50	-1.98,-0.98
C076	swim	misfit		misfit
C077	strap	-1.01	0.47	-1.48,-0.74
C078	bled	misfit		misfit
C079	brag	-1.01	0.47	-1.48,-0.74
C080	flat	-1.73	0.52	-2.25,-1.21
C081	snap	-2.01	0.54	-2.55,-1.21
C082	skunk	-2.01	0.54	-2.55,-1.21
C083	shred	0.10	0.40	-0.30, 0.50
C084	spot	-1.73	0.52	-2.25,-1.21
C085	split	-0.42	0.43	-0.85, 0.01
C086	scrub	-0.61	0.44	-1.05,-0.17
C087	crib	-0.06	0.41	-0.47, 0.35
C088	sled	-1.01	0.47	-1.48,-0.54
C089	grab	-1.73	0.52	-2.25,-1.21
C090	graph	-0.06	0.41	-0.47, 0.35
C091	spring	-1.24	0.48	-1.72,-0.76
5. L and N, C and G Patterns				
C001	page	-1.01	0.47	-1.48,-0.54
C002	gem	1.41	0.36	1.05, 1.77
C003	huge	1.54	0.36	1.18, 1.90
C004	ugly	0.10	0.40	-0.30, 0.50
C005	trace	-0.80	0.45	-1.25,-0.35
C006	camera	0.26	0.40	-0.14, 0.66
C007	cigar	1.67	0.36	1.31, 2.03
C008	cent	misfit		misfit
C009	cable	0.10	0.40	-0.30, 0.50
C010	guest	-0.06	0.41	-0.47, 0.35
C011	fringe	1.67	0.36	1.31, 2.03
C012	child	-1.48	0.50	-1.98,-0.98
C013	think	-2.32	0.57	-2.89,-1.75
C014	bolt	0.26	0.40	-0.14, 0.66
C015	kind	-1.24	0.48	-1.72,-0.76
C016	gold	-2.01	0.54	-2.55,-1.47
C017	strong	-1.24	0.48	-1.72,-0.76
C018	string	-0.80	0.45	-1.25,-0.35
C019	scold	-0.42	0.43	-0.85, 0.01
C020	tall	-0.42	0.43	-0.85, 0.01
C021	find	-1.01	0.47	-1.48,-0.54
C022	bald	1.67	0.36	1.31, 2.03
C023	wild	-0.61	0.44	-0.95,-0.17
C024	shrink	0.26	0.40	-0.14, 0.66

Appendix B, continued

ITEM NAME	ITEM	d_i	$Se(d_i)$	68%CI for d_i
6. Magic E (Vowel Subgroup)				
V101	tape	-0.61	0.44	-1.05,-0.17
V102	cute	1.00	0.37	0.63, 1.37
V103	mate	misfit		misfit
V104	snake	-1.48	0.50	-1.98,-0.98
V105	fate	misfit		misfit
V106	code	-0.61	0.44	-1.05,-0.17
V107	vane	-0.06	0.41	-0.47, 0.35
V108	cone	-2.32	0.57	-2.89,-1.75
V109	rule	misfit		misfit
V110	lime	-1.48	0.50	-1.98,-0.98
V111	hope	-1.24	0.48	-1.72,-0.76
V112	kite	misfit		misfit
V113	June	-2.01	0.54	-2.55,-1.47
V114	fine	-2.01	0.54	-2.55,-1.47
V115	Pete	misfit		misfit
V116	rate	0.42	0.39	0.03, 0.81
V117	chase	-1.01	0.47	-1.48,-0.54
V118	plate	-1.01	0.47	-1.48,-0.54
V119	wine	-0.80	0.45	-1.25,-0.35
V120	tube	-0.06	0.41	-0.47, 0.35
V121	phone	-1.01	0.47	-1.48,-0.54
V122	note	-1.24	0.48	-1.72,-0.76
V123	grime	0.42	0.39	0.03, 0.81
V124	size	-1.01	0.47	-1.48,-0.54
V125	cape	-0.80	0.45	-1.25,-0.35
V126	duke	-0.42	0.43	-0.85, 0.01
7. Vowel Combinations				
V059	oil	-1.73	0.52	-2.25,-1.19
V060	dawn	misfit		misfit
V061	toe	-2.32	0.57	-2.90,-1.75
V062	fail	misfit		misfit
V063	blood	misfit		misfit
V064	buy	-1.48	0.50	-1.98,-0.98
V065	sour	0.86	0.38	0.48, 1.24
V066	chews	0.26	0.40	-0.14, 0.66
V067	cream	misfit		misfit
V068	haul	0.72	0.38	0.34, 1.10
V069	few	-0.61	0.44	-1.05,-0.17
V070	seal	-1.01	0.47	-1.48,-0.54
V071	spray	-1.01	0.47	-1.48,-0.54
V072	rain	-1.48	0.50	-1.98,-0.98
V073	mean	-1.24	0.48	-1.72,-0.76
V074	die	misfit		misfit
V075	sleep	-2.01	0.54	-2.55,-1.47
V076	head	-1.01	0.47	-1.48,-0.54
V077	crook	0.10	0.40	-0.30, 0.50
V078	goes	misfit		misfit
V079	groan	misfit		misfit

Appendix B, continued

ITEM NAME	ITEM	d_i	Se(d_i)	68%CI for d_i
V080	house	-2.01	0.54	-2.55,-1.47
V081	beat	-1.01	0.47	-1.48,-0.54
V082	shout	-0.24	0.42	-0.66, 0.18
V083	haunt	2.17	0.35	2.52, 1.82
V084	key	-1.73	0.52	-2.25, 1.21
V085	suit	0.42	0.39	0.03, 0.81
V086	pour	misfit		misfit
V087	soup	-0.06	0.41	-0.47, 0.35
V088	draw	-1.48	0.50	-1.98,-0.98
V089	boil	0.10	0.40	-0.30, 0.50
V090	nail	misfit		misfit
V091	ouch	-0.61	0.44	-1.05,-0.17
V092	throws	-0.24	0.42	-0.66, 0.18
V093	pies	-1.24	0.48	-1.72,-0.76
V094	quack	-0.06	0.41	-0.47, 0.35
V095	soil	-0.24	0.42	-0.66, 0.18
V096	soul	misfit		misfit
V097	mow	misfit		misfit
V098	hoax	2.30	0.35	1.95, 2.65
V099	paid	-0.61	0.44	-1.05,-0.17
V100	oak	-1.73	0.52	-2.25,-1.21
	8. Vowel Sounds			
V001	shard	0.72	0.38	0.34, 1.10
V002	shun	0.57	0.39	0.18, 0.96
V003	mesh	1.27	0.37	0.90, 1.64
V004	gust	-0.42	0.43	-0.85, 0.01
V005	pox	misfit		misfit
V006	winch	0.86	0.38	0.48, 1.24
V007	wend	0.10	0.40	-0.30, 0.50
V008	yen	0.72	0.38	0.34, 1.10
V009	shod	1.41	0.36	1.05, 1.77
V010	quip	misfit		misfit
V011	nib	0.86	0.38	0.48, 1.24
V012	quest	1.92	0.36	1.56, 2.28
V013	fend	0.10	0.40	-0.30, 0.50
V014	skiff	0.42	0.39	0.03, 0.81
V015	sop	1.00	0.37	0.63, 1.37
V016	null	0.86	0.38	0.48, 1.24
V017	nub	0.86	0.38	0.48, 1.24
V018	stint	1.41	0.36	1.05, 1.77
V019	pip	0.57	0.39	0.18, 0.96
V020	bog	0.57	0.39	0.18, 0.96
V021	shrug	misfit		misfit
V022	mime	0.72	0.38	0.34, 1.10
V023	truce	misfit		misfit
V024	brad	0.72	0.38	0.34, 1.10
V025	bade	0.86	0.38	0.48, 1.24
V026	fie	1.67	0.36	1.31, 2.03
V027	rue	misfit		misfit
V028	crone	1.00	0.37	0.63, 1.37
V029	lush	0.57	0.39	0.18, 0.96

Appendix B, continued

ITEM NAME	ITEM	d_i	Se(d_i)	68%CI for d_i
V030	mace	1.14	0.37	0.77, 1.51
V031	bide	1.00	0.37	0.63, 1.37
V032	leek	misfit		misfit
V033	node	misfit		misfit
V034	fume	1.14	0.37	0.77, 1.51
V035	jot	-0.42	0.43	-0.85, 0.01
V036	cusp	0.10	0.40	-0.30, 0.50
V037	hasp	0.10	0.40	-0.30, 0.50
V038	gel	2.79	0.35	2.44, 3.14
V039	vat	0.10	0.40	-0.30, 0.50
V040	dram	1.41	0.36	1.05, 1.77
V041	lull	1.00	0.37	0.63, 1.37
V042	plat	0.42	0.39	0.03, 0.81
V043	probe	1.27	0.37	0.90, 1.64
V044	opt	1.00	0.37	0.63, 1.37
V045	nape	1.79	0.36	1.43, 2.15
V046	deem	0.42	0.39	0.03, 0.81
V047	eke	misfit		misfit
V048	stafe	1.92	0.36	1.56, 2.28
V049	hilt	misfit		misfit
V050	cog	0.26	0.40	-0.14, 0.66
V051	cud	0.57	0.39	0.18, 0.96
V052	twill	0.42	0.39	0.03, 0.81
V053	cad	misfit		misfit
V054	nab	0.42	0.39	0.03, 0.81
V055	sprig	2.55	0.35	2.20, 2.90
V056	grog	0.86	0.38	0.48, 1.24
V057	cult	1.14	0.37	0.77, 1.51
V058	quill	1.00	0.37	0.63, 1.37
	9. Compound Words (Word Structure Subgroup)			
W087	sidewalk	-1.48	0.50	-1.98,-0.98
W088	taxicab	misfit		misfit
W089	baseball	-1.48	0.50	-1.98,-0.98
W090	classroom	-1.24	0.48	-1.72,-0.76
W091	grandmother	misfit		misfit
W092	lipstick	misfit		misfit
W093	rocketship	misfit		misfit
W094	earthquake	-1.01	0.47	-1.48,-0.54
W095	basketball	-0.42	0.43	-0.85, 0.01
W096	southeast	misfit		misfit
	10. Inflectional Endings			
W070	hopped	-1.24	0.48	-1.72,-0.76
W071	bigger	-0.42	0.43	-0.85, 0.01
W072	catches	-1.01	0.47	-1.48,-0.54
W073	dresses	misfit		misfit
W074	hoping	0.10	0.40	-0.30, 0.50
W075	hugging	-1.01	0.47	-1.48,-0.54
W076	closed	misfit		misfit

Appendix B, continued

ITEM NAME	ITEM	d_i	$Se(d_i)$	68%CI for d_i
W077	cuter	misfit		misfit
W078	filing	misfit		misfit
W079	singing	-0.42	0.43	-0.85, 0.01
W080	ended	-0.42	0.43	-0.85, 0.01
W081	fastest	misfit		misfit
W082	riding	1.41	0.36	1.05, 1.77
W083	rated	-1.48	0.50	-1.98,-0.98
W084	boxing	misfit		misfit
W085	wagged	-0.24	0.42	-0.66, 0.18
W086	dried	-1.24	0.48	-1.72,-0.76
11. Suffixes				
W047	action	misfit		misfit
W048	musical	-1.01	0.47	-1.48,-0.54
W049	slowly	1.54	0.36	1.18, 1.90
W050	division	misfit		misfit
W051	agreeable	1.27	0.37	0.90, 1.64
W052	sensible	misfit		misfit
W053	gradual	misfit		misfit
W054	poisonous	0.42	0.39	0.03, 0.81
W055	graceful	misfit		misfit
W056	native	1.41	0.36	1.05, 1.77
W057	official	0.10	0.40	-0.30, 0.50
W058	breakable	1.67	0.36	1.31, 2.03
W059	retirement	0.42	0.39	0.03, 0.81
W060	bendable	1.67	0.36	1.31, 2.03
W061	faithful	-0.42	0.43	-0.85, 0.01
W062	madness	misfit		misfit
W063	facial	1.14	0.37	0.77, 1.51
W064	ability	0.42	0.39	0.03, 0.81
W065	thickness	1.92	0.36	1.56, 2.28
W066	simplify	1.67	0.36	1.31, 2.03
W067	pollution	misfit		misfit
W068	tension	0.72	0.38	0.34, 1.10
W069	talkative	misfit		misfit
12. Prefixes				
W025	subhuman	1.00	0.37	0.63, 1.37
W026	informal	misfit		misfit
W027	removal	misfit		misfit
W028	inhuman	misfit		misfit
W029	misspell	0.57	0.39	0.18, 0.96
W030	enclosed	misfit		misfit
W031	dismissal	2.79	0.35	2.44, 3.14
W032	unintentional	1.54	0.36	1.18, 1.90
W033	misdirect	2.67	0.35	2.32, 3.02
W034	precautionary	3.41	0.35	3.06, 3.76
W035	ultraviolet	0.42	0.39	0.03, 0.81
W036	renew	misfit		misfit
W037	untie	misfit		misfit
W038	subway	misfit		misfit

Appendix B, continued

ITEM NAME	ITEM	d_i	$Se(d_i)$	68%CI for d_i
W039	nonsense	1.92	0.36	1.56, 2.28
W040	inexpensive	misfit		misfit
W041	dislike	misfit		misfit
W042	supervision	1.79	0.36	1.43, 2.15
W043	intercity	2.55	0.35	2.20, 2.90
W044	inexact	2.05	0.36	1.69, 2.41
W045	unnatural	3.16	0.35	2.81, 3.51
W046	unconscious	misfit		misfit
13. Multisyllable Words				
W001	inconsequential	4.29	0.36	3.93, 4.65
W002	rationalization	3.54	0.35	3.19, 3.89
W003	quagmire	3.78	0.35	3.43, 4.13
W004	anthropological	misfit		misfit
W005	polarity	misfit		misfit
W006	photosynthesis	misfit		misfit
W007	tachometer	4.55	0.36	4.19, 4.91
W008	conscientious	4.55	0.36	4.19, 4.91
W009	procrastinate	3.54	0.35	3.19, 3.89
W010	philanthropist	4.42	0.36	4.06, 4.78
W011	anatomical	4.04	0.36	3.68, 4.40
W012	inexplicable	4.16	0.36	3.80, 4.52
W013	parenthetically	misfit		misfit
W014	implementation	misfit		misfit
W015	appreciate	3.78	0.35	3.43, 4.13
W016	incipient	misfit		misfit
W017	discrepancy	3.78	0.35	3.43, 4.13
W018	suspicious	4.04	0.36	3.68, 4.40
W019	calisthenics	misfit		misfit
W020	variability	4.16	0.36	3.80, 4.52
W021	anatomical	4.04	0.36	3.68, 4.40[1]
W022	abominable	misfit		misfit
W023	familiarity	4.42	0.36	4.06, 4.78
W024	ornithology	misfit		misfit

[1] "anatomical" appeared twice in the Inventory, producing identical results for the replication.

Appendix C- Administration of the Emory Word Analysis Skill Inventory, Form A.

Directions to the test administrator:

Use a pencil. Record the child's answers on the map profile attached to this test form. The child should read from a list of words similar to the form below. Where possible, record specific patterns of incorrect responses on a separate sheet of paper. Place an X through each word the child answers correctly on the map. Try not to make an incorrect response obvious. The child should begin with the first scale (Consonant Digraphs) and procede in order throughout the test. Ask each item on the scale- stopping only if at least three consecutive responses are made in close proximity. The suggested time for test administration is about 15 minutes.

EMORY WORD ANALYSIS SKILL INVENTORY- FORM A

1. Consonant Digraphs (Consonant Subgroup).
   Directions to student: "Sometimes consonants are blended together and sometimes consonants are combined to form a new sound. Read each of the following words, starting with number 1."

   1. what 2. lunch 3. shark 4. hang 5. witch 6. whip

   7. shut 8. path 9. chop 10. lung 11. thumb

2. Final Blends and Double Consonants
   Directions to student: "Sometimes the consonant clusters (or blends) are at the end of the word. Read each of these words."

   1. farm 2. part 3. hunt 4. soft 5. lifts 6. dump

   7. rest 8. slept 9. stumps 10. silk 11. splints 12. wasp

3. R Controls
   Directions to student: "Read each of the following words."

   1. word 2. third 3. turn 4. worm 5. jerk 6. curb

   7. sir

4. Initial Blends
   Directions to student: "Many words have a cluster of consonants at the beginning. Read each word."

Appendix C, continued

1. snap 2. flat 3. trap 4. spring 5. strap

6. scrub 7. split 8. crib 9. shred

5. L and N, C and G Patterns

Directions to student: "Read each of the following words."

1. think 2. gold 3. child 4. kind 5. page 6. trace

7. wild 8. scold 9. guest 10. ugly 11. bolt 12. gem

13. huge 14. cigar

6. Magic E (Vowel Subgroup)

Directions to student: "Read each of the following words."

1. cone 2. June 3. snake 4. hope 5. chase 6. wine

7. tape 8. duke 9. vane 10. rate 11. cute

7. Vowel Combinations

Directions to student: "Read each of the following words."

1. toe 2. sleep 3. oil 4. buy 5. mean 6. seal

7. few 8. shout 9. soup 10. crook 11. chews 12. suit

13. haul 14. sour 15. haunt 16. hoax

8. Vowel Sounds

Directions to student: "These words may be real words or nonsense words. Read each of them."

1. jot 2. wend 3. cog 4. skiff 5. shun 6. shard

7. winch 8. sop 9. mace 10. mesh 11. shod 12. fie

13. nape 14. quest 15. sprig 16. gel

9. Compound Words

Directions to student: "Read each of the following words."

1. sidewalk 2. classroom 3. earthquake 4. basketball

10. Inflectional Endings

Directions to student: "Some words contain a root and an ending. Read each of the following words."

1. rated 2. dried 3. catches 4. bigger 5. wagged

6. hoping 7. riding

Appendix C, continued

11. Suffixes

Directions to student: "Some words have suffixes. Read each of the following words."

1. musical 2. faithful 3. bendable 4. poisonous
5. tension 6. facial 7. agreeable 8. native
9. slowly 10. breakable 11. thickness

12. Prefixes

Directions to student: "Some words have prefixes. Read each of the following words."

1. ultraviolet 2. misspell 3. subhuman 4. unintentional
5. supervision 6. nonsense 7. inexact 8. intercity
9. misdirect 10. dismissal 11. unnatural 12. precautionary

13. Multisyllable Words

Directions to student: "These words have many syllables. Read each word."

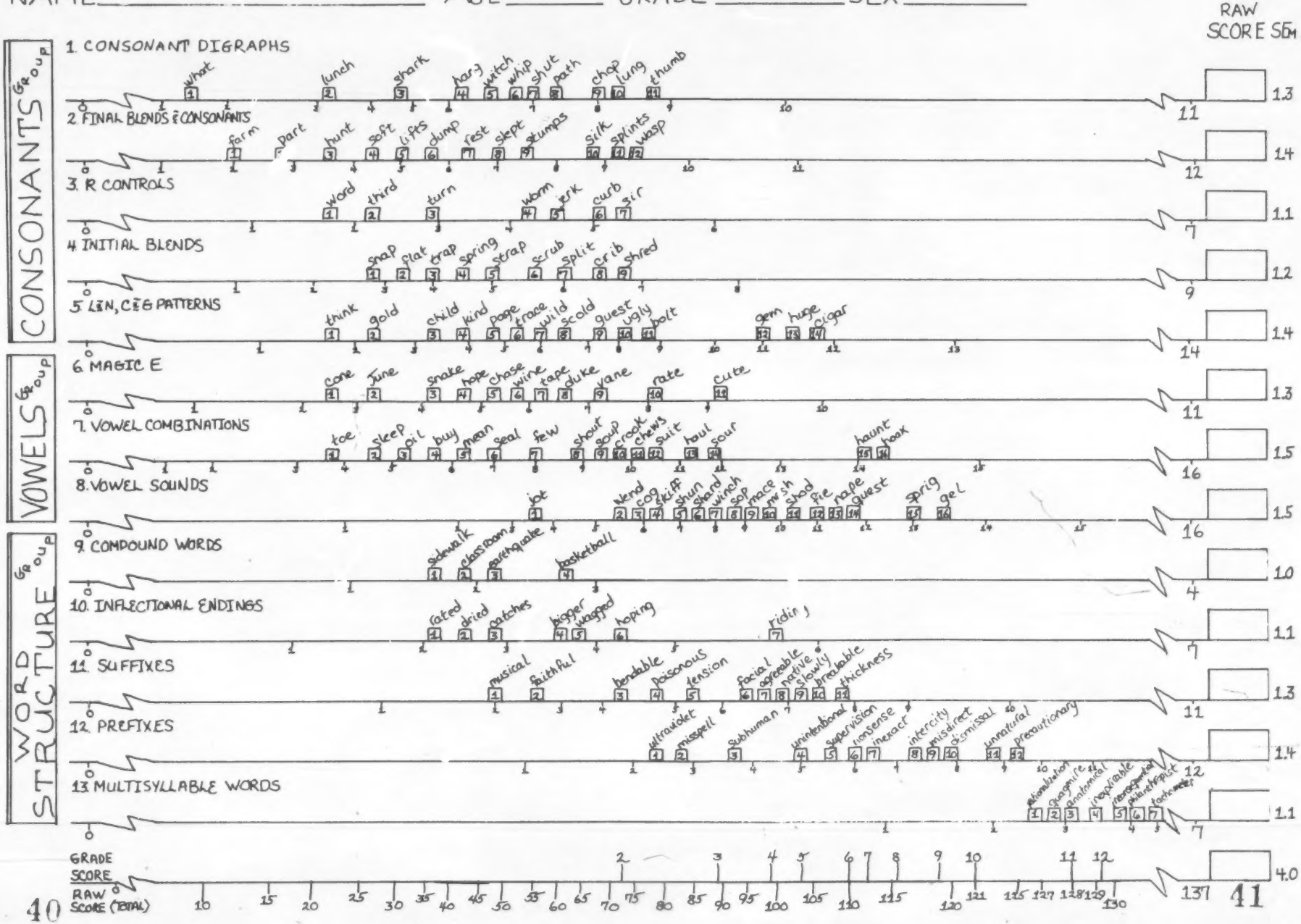
1. rationalization 2. quagmire 3. anatomical 4. inexplicable
5. inconsequential 6. philanthropist 7. tachometer

After the test has been administered, each pattern of responses should be analyzed for their diagnosis of mastery and/or clinical implications for instruction. Since each question on each subscale increases in difficulty, the child's responses should reflect this trend. Also, remember that as one moves vertically along the page from left to right, difficulty increases along the same line- indicated on the bottom line of the test map labelled "Grade Score/ Raw Score." It should be possible to pinpoint the child's word analysis skill by circling the total raw score and drawing a vertical line down the map which crosses the corresponding total score.

EMORY WORD ANALYSIS SKILL INVENTORY - FORM A

DATE _____

NAME _____ AGE _____ GRADE _____ SEX _____


RAW SCORE SEM
CONSONANTS GROUP
1. CONSONANT DIGRAPHS
what lunch shark harp watch whip shut path chop lung thumb
1.3
2. FINAL BLENDS & CONSONANTS
farm part hunt soft lifts dump rest slept stumps silk splints wasp
1.4
3. R CONTROLS
word third turn worm jerk curb sir
1.1
4. INITIAL BLENDS
snap flat trap spring strap scrub split crib shred
1.2
5. LIN, C&G PATTERNS
think gold child kind page trace wild scold guest ugly bolt gem huge cigar
1.4
VOWELS GROUP
6. MAGIC E
cone June snake hope chase wine tape duke vane rate cute
1.3
7. VOWEL COMBINATIONS
toe sleep oil buy mean seal few shout soup croak chews suit haul sour haunt hook
1.5
8. VOWEL SOUNDS
jot wind cog skiff shun shard wrinch sop mace mush shod fie rape guest sprig gel
1.5
WORD STRUCTURE GROUP
9. COMPOUND WORDS
sidewalk classroom earthquake basketball
1.0
10. INFLECTIONAL ENDINGS
rated dried catches bigger wagged hoping riding
1.1
11. SUFFIXES
musical faithful bendable poisonous tension facial agreeable native slowly breakable thickness
1.3
12. PREFIXES
ultraviolet misspell subhuman unintentional supervision transense inexact intercity misdirect dismissal unnatural precautionary
1.4
13. MULTISYLLABLE WORDS
abomination quagmire anatomical inexplicable stenographer philanthropist forthcoming
1.1
GRADE SCORE
RAW SCORE (TOTAL)
4.0

Appendix D- Administration of the Emory Word Analysis Skill Inventory, Form B.

Directions to the test adminstrator:

Use a pencil. Record the child's answers on the map profile attached to the test form. The child should read from a list of words similar to the form below. Where possible, record specific patterns of incorrect responses on a separate sheet of paper. Place an X through each word the child answers correctly on the map. Try not to make an incorrect response obvious. The child should begin with the first scale (Consonant Digraphs) and procede in order throughout the test. Ask each item on the scale- stopping only if at least three consecutive responses are made in close proximity. The suggested time for test administration is about 15 minutes.

EMORY WORD ANALYSIS SKILL INVENTORY- FORM B

1. Consonant Digraphs (Consonant Subgroup)
   Directions to student: "Sometimes consonants are blended together and sometimes consonants are combined to form a new sound. Read each of the following words, starting with number 1."

1. them 2. lunch 3. shark 4. half 5. chart 6. whip
7. shut 8. check 9. chop 10. lung 11. thumb

2. Final Blends and Double Consonants
   Directions to student: "Sometimes the consonant clusters (or blends) are at the end of the word. Read each of these words."

1. farm 2. part 3. cuff 4. soft 5. lifts 6. mend
7. rest 8. spill 9. stumps 10. silk 11. splints 12. gulp

3. R Controls
   Directions to student: "Read each of the following words."

1. word 2. lord 3. turn 4. worm 5. jerk 6. curb 7. sir

4. Initial Blends
   Directions to student: "Many words have a cluster of consonants at the beginning. Read each word."

Appendix D, continued

1. skunk 2. spot 3. trap 4. spring 5. brag

6. scrub 7. split 8. crib 9. shred

5. L and N, C and G Patterns

Directions to student: "Read each of the following words."

1. think 2. gold 3. child 4. strong 5. find 6. string

7. wild 8. tall 9. guest 10. cable 11. shrink 12. gem

13 huge 14. cigar

6. Magic E (Vowel Subgroup)

Direction to student: "Read each of the following words."

1. cone 2. fine 3. lime 4. note 5. plate 6. cape

7. code 8. duke 9. tube 10. grime 11. cute

7. Vowel Combinations

Directions to student: "Read each of the following words."

1. toe 2. house 3. key 4. rain 5. pies 6. spray

7. ouch 8. throws 9. quack 10. boil 11. chews 12. suit

13 haul 14. sour 15. haunt 16. hoax

8. Vowel Sounds

Directions to student: "These words may be real words or nonsense words. Read each of them."

1. gust 2. fend 3. cog 4. plat 5. pip 6. mime

7. nib 8. crone 9. fume 10. probe 11. stint 12. fie

13 nape 14. stafe 15. sprig 16. gel

9. Compound Words

Directions to student: "Read each of the following words."

1. baseball 2. classroom 3. earthquake basketball

10. Inflectional Endings

Directions: "Some words contain a root and an ending. Read each word."

1. rated 2. hopped 3. hugging 4. singing 5. wagged 6. hoping

7. riding

Appendix D, continued

11. Suffixes

Directions to student: "Some words have suffixes. Read each of the following words."

1. musical 2. faithful 3. official 4. retirement
5. tension 6. facial 7. agreeable 8. native
9. slowly 10. simplify 11. thickness

12. Prefixes

Directions to student: "Some words have prefixes. Read each of the following words."

1. ultraviolet 2. misspell 3. subhuman 4. unintentional
5. supervision 6. nonsense 7. inexact 8. intercity
9. misdirect 10. dismissal 11. unnatural 12. precautionary

13. Multisyllable Words

Directions: "These words have many syllables. Read each word."

1. procrastinate 2. discrepancy 3. suspicious 4. variability
5. inconsequential 6. familiarity 7. conscientious

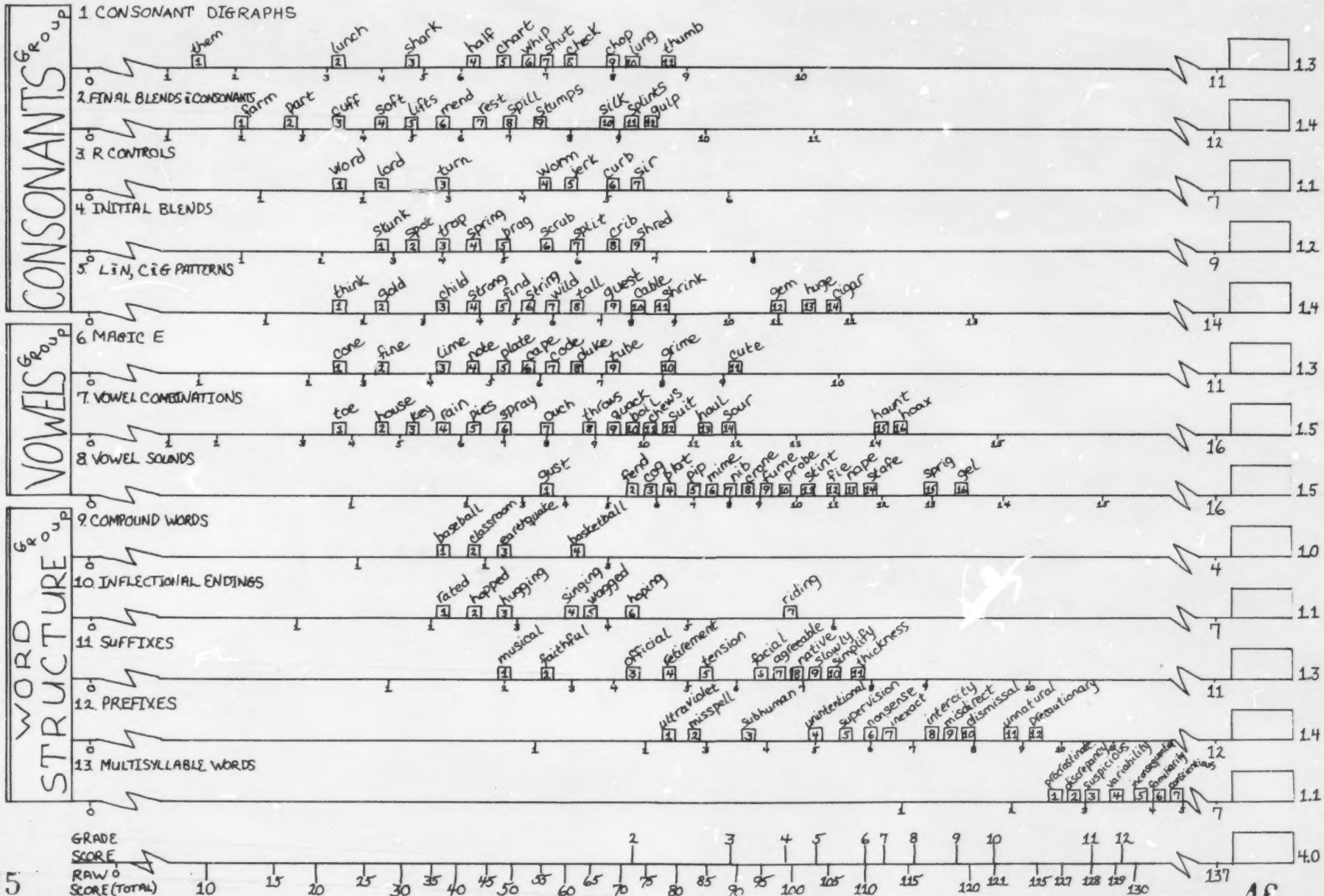
After the test has been administered, each pattern of responses should be analyzed for their diagnosis of mastery and/or clinical implications for instruction. Since each question on each subscale increases in difficulty, the child's responses should reflect this trend. Also, remember that as one moves vertically along the page from left to right, difficulty increases along the same line- indicated on the bottom line of the test map labelled "Grade Score/ Raw Score." It should be possible to pinpoint the child's word analysis skill by circling the total raw score and drawing a vertical line down the map which crosses the corresponding total score.

EMORY WORD ANALYSIS SKILL INVENTORY – FORM B

NAME _____ AGE _____ GRADE _____ SEX _____

DATE _____

RAW SCORE SEM


CONSONANTS GROUP
1. CONSONANT DIGRAPHS
them lunch shark half chart whip shut check chop lung thumb
1.3
2. FINAL BLENDS & CONSONANTS
farm part cuff soft lifts mend rest spill stumps silk splints gulp
1.4
3. R CONTROLS
word lord turn worm jerk curb sir
1.1
4. INITIAL BLENDS
stunk spot trap spring drag scrub split crib shred
1.2
5. LIN, CIG PATTERNS
think gold child strong find string wild tall guest cable shrink gem huge cigar
1.4
VOWELS GROUP
6. MAGIC E
cone fine lime note plate cape code duke tube crime cute
1.3
7. VOWEL COMBINATIONS
toe house key rain pies spray ouch throws quack bait chews suit haul sour haunt hoax
1.5
8. VOWEL SOUNDS
gust fend cog blot pip mime rib throne fume probe stint file tape shape sprig gel
1.5
WORD STRUCTURE GROUP
9. COMPOUND WORDS
baseball classroom earthquake basketball
1.0
10. INFLECTIONAL ENDINGS
rated hopped hugging singing wagged hoping riding
1.1
11. SUFFIXES
musical faithful official retirement tension facial agreeable native slowly simplify thickness
1.3
12. PREFIXES
ultraviolet misspell subhuman unintentional supervision nonsense inexact intercity misdirect dismissal unnatural precautionary
1.4
13. MULTISYLLABLE WORDS
procrastinate discrepancy suspicious variability incongruous familiarity carelessness
1.1
GRADE SCORE
4.0
RAW SCORE (TOTAL)